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ABSTRACT

In October 1996, the Hartford Public Schools (Connecticut) received a grant for a partnership in minority student achievement, but in 1998, the grant was not renewed. This is the final year-end report on the Hartford Comprehensive Partnerships for Mathematics and Science Achievement (CPMSA) covering the program's second year. Fourteen schools were identified for CPMSA activities. The students enrolled in these schools represent 52% of the total student population of 22,531 in all the Hartford Public Schools. Multiple data sources were used to evaluate the program's effectiveness. Evaluation of the second year for CPMSA found a different and more effective form of implementation than seen in the first year, in part due to the appointment of a full-time program director. The most significant issues associated with CPMSA were those that stemmed from ongoing problems in the school district. The chaos in the public school system made it difficult for program activities to unfold as planned. The most significant problem was the removal of the former superintendent, coupled with the appointment of two interim superintendents and the eventual hiring of a new permanent superintendent. Key partners in the Hartford community expressed strong support of the CPMSA initiative and related efforts for systemic reform of mathematics and science education, but the district was not able to commit itself to the program. (Contains 10 figures and 20 tables.) (SLD)

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ED 432 579

CPMSA

Comprehensive Partnerships for Mathematics and Science Achievement

Hartford Public Schools

Year-End Report

March 1999

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CPMSA

Comprehensive Partnerships for Mathematics and Science Achievement

HARTFORD PUBLIC SCHOOLS
1997-1998 Year-End Report

1. INTRODUCTION

In October 1996, Hartford Public Schools received the Comprehensive Partnerships for the Minority Student Achievement (CPMSA) grant from the National Science Foundation (NSF) for a total of $950,000 over two years, ending in September 1998. There were provisions from NSF for renewal of the grant during subsequent years. In October 1997, officials of the Hartford Public Schools retained Curriculum Research & Evaluation (CRE) to serve as external evaluator for years one and two of the Hartford CPMSA.

In 1998, due to a number of local education issues that jeopardized substantive progress toward systemic change, NSF chose not to renew the CPMSA grant for Hartford Public Schools.

This is CRE's final year-end report on CPMSA activities in Hartford. The content follows the outline of questions established by NSF for CPMSA evaluation studies. The reader is encouraged to examine CRE's 1996-97 year-end report and the 1997-98 mid-year report.

A. Demographic Information

Number of students in the school district. Current grand total student enrollment in the Hartford Public School System is 22,531 (Hartford Public Schools data for October 1, 1998).

Number of students in the school district living below the poverty level. The number of students in the Hartford Public Schools who live below the poverty level (as determined by percent of students receiving free and reduced-price meals) is 18,318, or 81.3% of the grand total student enrollment (Strategic School Profiles, Fall 1997). By contrast, 23.9% of the school age students statewide live below the poverty level.

Number of students directly involved in CPMSA activities. During the second year of the Hartford Comprehensive Partnerships for Mathematics and Science Achievement (CPMSA) grant, there were fourteen schools which the school district identified for CPMSA activities. The current total number of students enrolled in CPMSA targeted schools is 52% of the total student population enrolled in all Hartford Public Schools, which is an increase of more than 300% from the number of students enrolled in CPMSA targeted schools during the first year.

The names of these schools, their grade levels, and current student enrollments (as of October 1, 1998), June 1998 student enrollments, and percent of change are:

School	Grade Level	Enrollment 6/98	Enrollment 10/98	% Change
Batchelder	PK-6	543	570	5% +
Burns	PK-6	731	664	9% -
Burr	K-8	678	662	2% -
Dwight	PK-6	575	588	2% -
Annie Fisher	PK-6	761	728	4% -
M.D. Fox	K-5	1,045	1,032	1% -
Mary Hooker	PK-5	347	279	20% -
Kennelly	K-8	881	911	3% +
Kinsella	PK-6	516	548	6% +
Naylor	K-8	550	547	.05% -
Fox Middle	7-8	934	898	4% -
Quirk Middle	7-8	1,198	1,216	2% +
South Middle	6-8	696	700	.06% +
Bulkeley High	9-12	1,209	1,396	15% +
TOTAL STUDENTS IN CPMSA		10664	10739	.07% +
% OF TOTAL STUDENT ENROLLMENT		46%	52%	6% +

(Note: underline indicates the four schools that participated during the first year.)

Number and type of school district activities sponsored by the NSF's CPMSA program. Hartford Public School's central office personnel established three committees for the CPMSA program.

There was a Governing Board that was composed of Hartford Public School's central office personnel, including the principal investigator, co-principal investigator, and math, science, and technology chairpersons; representatives from the Connecticut State Department of Education, including the Commissioner of Education, Deputy Commissioner of Education, and state math and science consultants; representatives from business and industry; and representatives from the Connecticut Academy for Education in Mathematics, Science, and Technology (Connecticut's SSI, Project CONNSTRUCT). The Governing Board was established in the first year to provide oversight for the CPMSA grant.

Also, there was an Advisory Committee, made up of Hartford Public School's central office personnel, chiefly the chairpersons of math, science, and technology, and the fourteen building principals. The Advisory Committee met periodically during the year to discuss strategies for implementation and issues associated with the CPMSA grant on both within school building and between school building levels.

There was also an Academic Council, which consisted of K-12 classroom teachers, who expressed an interest in leadership roles for the CPMSA's teacher training program. The purpose of the Academic Council was to transfer information to staff and serve as a teacher training model.

Data shows that the Governing Board met on four occasions during the second year. Attendance was spotty, however, representatives from the CSDE, Connecticut Academy, and UTC were always present. The Advisory Committee met on four occasions from September 1997 through June 1998. The building principals were asked to attend Advisory Council meetings with their staff. Approximately half did so.

The Academic Council met regularly during the year for the purpose of advancing the agenda for CPMSA and informing teachers and building principals about the initiative. Topics for current and future meetings that were proposed by the Academic Council included visits to the Brookhaven National lab, workshops on mini-grant writing, planning for the 1998 summer enrichment program, and dissemination of up-to-date information regarding CPMSA. The teachers' interest in workshops on writing mini-grants was stimulated by several colleagues, who successfully pursued funds from corporations—including Microsoft and GTE—to support professional development activities in mathematics, science, and technology for teachers and related activities for their students.

1. Building Level Activity

The principal of Henry C. Dwight Elementary School provided an example of building level activity sponsored by CPMSA, during year two. Included were student activities, staff activities, and parents activities.

STUDENT ACTIVITIES

September 5, 1997	Visit to school by NASA astronaut Katherine Coleman to grades 4, 5, and 6. There were 195 students in the assembly.
November 12-14, 1997	Visit by representatives of NASA on a national tour to grades 4, 5, and 6. Student attendance: 190. There was general assembly and individual classes.
February 10, 1998	Dwight School Science Fair during which all 545 K-6 students participated.
February - March 1998	Dwight School After School computer class for 12 students.

STAFF ACTIVITIES

October, 1997	Computer workshops on Windows 95 and Office 97 for staff. Attendance: 4-7 teachers.
November/December 1997	Loctite Software Training for 16 teachers who received computers .

PARENTS ACTIVITIES

September 20, 1997	Parents-Teachers Kickoff event and Fun Fair focused on Connecticut Mastery Test(CMT) skills. Attendance 400 parents.
November 12, 1997	Lego Night during which Lego projects were completed by 75 parents for purpose of developing critical thinking.
February 25, 1998	Workshop on CMT test results during which parents took a practice test. There were 6 parents who participated.
March 11, 1998	Field trip to the Science Museum of Connecticut for 40 parents and 70 students.

2. Hartford Public Schools Activity

In January 1998, Hartford Public Schools adopted "The Superintendent's Implementation Plan for Information Technology: 1998-2001," which is designed to enable the district to accomplish the "1994 Strategy" and the more recent "48 Recommendations for School Improvement." Key areas of the plan include development of skills and competencies, integrated technology, access to integrated technology tools, quality and timely support, and leadership.

On February 24 and 25, Hartford Public Schools held its 8th Annual Citywide Mathematics, Science, and Technology Fair at Moylan Elementary School.

During fall 1997 and spring 1998, Hartford Public Schools provided professional development courses free to any teachers, certified and non-certified staff, and parents of a Hartford Public School child. The main purpose of these courses was to raise student achievement on the Connecticut Mastery Test (CMT) and the Connecticut Academic Performance Test (CAPT) by improving teaching and learning. The staff development program included courses in mathematics, science, and technology applications for teaching and learning. Technology training courses were held at one of the UTC supported Technology Learning Centers, which are located at Moylan, South Middle, and Weaver High schools.

3. Partnerships Activity

The Mathematics Resource Center, which is operated by Mr. Richard Barton, Executive Director, provides in-house and off-site tutorial services to students who need assistance with mathematics achievement, particularly at Weaver and Bulkeley high schools. Mr. Barton consults regularly with high school principals, mathematics department chairpersons, head guidance personnel, Curriculum and Staff Development Director, and Assistant Superintendent on methods and strategies for retaining students. One of their conclusions is

that students tend to drop out of school when they discover that they have failed a number of courses. The district has responded to this issue by expanding after school programs on a "for credit" basis, with assistance from the Mathematics Resource Center. Interestingly, the district's decision to charge fees for students who need to make up credit has been received in a very positive way by parents in the community.

Dr. Timothy Craine, of Central Connecticut State University, presented professional development workshops, during fall 1997 and spring 1998, pertaining to teaching mathematics, grades 6-12, for the Hartford Public Schools teachers.

Dr. Marilyn Schaffer, of the University of Hartford, presented a seminar on leadership during fall 1997. Also, she presented workshops on technology, science, and mathematics for grades K-12, during spring and summer 1998, for the Hartford Public Schools teachers. The special emphases of these workshops included the kit-based science plan for elementary school teachers and curriculum development to revise and realign the K-12 science and math curricula for local, state, and national standards. Documentation indicates that these technology workshops have had maximum enrollments by Hartford teachers.

Sr. Claire Markham, Ph.D., of Saint Joseph College, provided a Leadership Science Teacher Institute during fall 1997 for elementary school teachers in the Hartford Public Schools. Topics included "Adventures in Science;" STC and FOSS science kits; and outreach programs for children, such as science, mathematics, nutrition, and computer clubs.

Connecticut Pre-Engineering Program (CPEP), provided two 1998 summer programs—Summer Science Camps—for Hartford students and their teachers who attend CPMSA target elementary and middle schools. Parents were invited to participate in field trips, Physics Olympics, and final awards ceremony. Also, CPEP provided a five-week Summer Science Camp at Trinity College during summer 1997 for students entering grades 8^{h} and 9 and who attend CPMSA schools.

Additionally, CPEP provided after school programs to students attending CPMSA elementary, middle, and secondary schools in Hartford. Topics for these classes concerned various applications of science, including roller coasters, model bridge construction, and robotics. Students' activities focused on development of skill with computer use, mathematics, science, critical thinking, problem solving, and engineering skills.

During fall 1997, CPEP also provided 12 workshops for Hartford Public Schools teachers from CPMSA schools. Sites included Central Connecticut State University and University of Hartford. Topics focused on science, mathematics, engineering, and technology. CPEP offered a similar series of workshops during spring 1998 at University of Connecticut Health Center, Central Connecticut State University, and Trinity College. Finally, CPEP encouraged K-6 parent involvement at targeted CPMSA schools through offering activities for parents to support students' achievement on the Connecticut Mastery Test (CMT), science fair activities, use of community resources for field trips, family math and family science nights,

and technology nights for families. These projects were conducted in association with the Hartford-based organization, OPMAD, Organized Parents Make A Difference.

During fall 1997 and spring 1998, Central Connecticut State University presented its Partners in Science Program. The program brings together students, teachers, and college faculty for enriching study of biology, chemistry, physics, earth science, and technology. Participants included 11 students from Hartford's Quirk Middle School. Topics for workshops included Night Sky, Cells and Math, Building a Motor, Chemistry Magic, Computer-Aided Drafting, Seaweeds, and many others. All courses were taught by CCSU professors from the various departments of mathematics, science, and technology.

Partnership activity between CPMSA and United Technologies Corporation led to matched funds to support purchase of laptop computers and e-mail for all vanguard teachers associated with the Technology Learning Centers at South Middle School, Moylan Elementary School, and Weaver High School.

B. Goals and Objectives

Goal of the Hartford CPMSA program. To develop systemic approaches that will substantially increase the number of under-represented minority students enrolling in pre-college "gatekeeper" science, engineering, and math (SEM) courses.

Objectives of the Hartford CPMSA program.

1. To establish a balanced emphasis on all phases of the K-12 academic pipeline with major emphases on math and science enrichment.
2. To examine existing school district policies for the purpose of adopting new policies to facilitate the goal of the CPMSA program and improve the delivery of educational programs throughout the district.
3. To examine existing budgeting practices for the purpose of leveraging funding streams to facilitate significant improvement in delivery of the district's educational programs, using NSF funding as the catalyst for systemic change.
4. To develop an effective management, communication, and evaluation plan to implement systemic change for the purpose of achieving CPMSA goals and objectives.
5. To plan and develop standards-based teacher professional development and student enrichment interventions in specifically targeted elementary, middle, and high schools in respect to "gatekeeper" courses, and to implement strategies with assistance from NSF that are designed to increase enrollments and successful completion of these courses.
6. To limit participant support in the CPMSA program for both students and teachers to members of the Hartford Public Schools.
7. To maintain a database, starting in 1996-97, of all Level I participants which shall be capable of tracking them throughout their pre-college education. This baseline data shall be used for developing quantitative numerical goals of 10% by the end of the 1997-98 school year on specific outcomes pertaining to students' course enrollment,

enrichment activities, and achievement. (Source: Cooperative Agreement, # HRD-9625121)

C. Relation of Goals and Objectives to Student Outcomes

Tabulated Indicators for Systemic Changes (TISC). Recently, Hartford Public Schools hired a new person to assist with data collection and analysis, with specific attention to the TISC reports. Also, district officials reported that successful implementation of CPMSA, and especially data collection and analysis, requires collaborative work of a large number of individuals, who are assembled and given tasks when the demand for data must be met. Their substantial and direct contributions, albeit part-time, were usually not documented.

Background information. Hartford Public Schools remain under state receivership. The controlling body is the Board of Trustees, which consists of representatives from different constituencies in the Hartford city area, who were appointed by Governor John Rowland in 1997 when the takeover occurred.

Two local issues influenced the direction and pace of implementing the Hartford CPMSA program:

- district's need to hire another new superintendent of schools (There will be five different superintendents in six years.) and
- completion of requirements at the city's flagship high school, Hartford Public High School, for accreditation from the New England Association of Schools and Colleges.

In May 1998, Hartford Board of Trustees asked the former Superintendent, Dr. Patricia Daniel, the last permanent superintendent, to resign for a number of reasons—the most important of which was her failure to provide various school records and other documentation in a timely manner to the Connecticut State Department of Education. Despite changes in superintendents and the current high school accreditation issue, the district was making progress, albeit slow, toward accountability in programming related to CPMSA. In particular, curriculum development on PK-12 levels continued in all content areas, especially mathematics and science.

Subsequent to Dr. Daniel's removal, the district appointed Dr. Benjamin Dixon, former Associate Commissioner of Education for the Connecticut State Department of Education (CSDE) to serve as Interim Superintendent. Dr. Dixon was recognized as a solid candidate for the position of Superintendent of Schools in Hartford, however, prior to his appointment to the superintendency, he had applied for a university position at Virginia Polytechnic Institute. Soon after the Board of Trustees appointed him to the Hartford Public Schools position, he was offered and accepted the appointment in Virginia. Dr. Dixon planned to continue in his duties as Superintendent until fall 1998.

In August1998, the Board of Trustees appointed Matthew Borrelli, former Assistant Superintendent for West Hartford Public Schools and recently appointed as Hartford Public Schools' chief of staff in charge of operational audit improvements, as the new interim

superintendent and Nancy Harris, formerly assistant superintendent for management services for Milford Public Schools, as assistant superintendent for finance and administration. Matthew Borrelli expressed interest only in serving as interim superintendent until the Board of Trustees hires someone as superintendent of schools, after which he would return to his position as chief of staff.

In February 1999, the Board of Trustees appointed Anthony Amato, former district superintendent in Manhattan, NY as Superintendent of Hartford Public Schools. Anthony Amato began work in Hartford immediately on a part-time basis, while completing his duties in Manhattan. He will work full time for the district beginning in summer 1999.

Despite these issues, a development in the second year of the Hartford CPMSA, which follows directly from recommendations of the first year evaluation, is establishment of a new organization chart. A second change was hiring a new, full time CPMSA Program Director, Ms. Frances Sanchez, a former science teacher for the Hartford Public Schools. The new chain of command gave Ms. Sanchez direct access to the Superintendent of Schools, Dr. Benjamin Dixon, who was Principal Investigator for the Hartford CPMSA. Additionally, Ms. Sanchez had a full time administrative assistant and had transferred management of CPMSA financial accounts from the curriculum division for direct control by CPMSA office personnel. These changes in organization, management, and accounting contributed to a more efficient and a more effective second year of activities by the Hartford CPMSA.

In Spring 1998, Hartford Public Schools hired Mr. Robert Borello, former elementary school principal, to serve as Secondary Science Chairperson for the district. This appointment of Mr. Borello satisfied the concern for having a science curriculum chairperson available. Also, Mr. Borello came to the Hartford Public Schools highly recommended by science curriculum specialists in the state and by representatives of the Connecticut Academy. His knowledge of science curriculum development in other school districts would be beneficial to Hartford.

Also, the Secondary Mathematics Chairperson, Mr. Jimmie Hill, was unavailable for work during most of winter and spring 1998, due to problems with his health. During Mr. Hill's absence, Dr. Anna Cimochowski, Assistant Superintendent for Support Programs and Services, and Mr. Allen Jones, Acting Director of Curriculum/Instruction/Assessment and Professional Development, administered all regular meetings with high school mathematics teachers.

Ms. Pamela Barker-Jones, whose qualifications include elementary and middle school mathematics, in addition to school administration, had responsibility for a range of services as chairperson in the areas of elementary mathematics, science, and technology. Additionally, she helped with secondary mathematics in Mr. Hill's absence. However, in fall 1998, Ms. Pamela Barker-Jones resigned from her position with Hartford Public Schools, due to issues concerning her job responsibilities.

With partial support from CPMSA, Hartford Public Schools hired Mr. Peter Perreria to serve as technology teacher system-wide.

In summer 1998, Frances Sanchez resigned from her position as Director of CPMSA.

In conclusion, appointments at the central office level focused on hiring personnel for the areas of CPMSA management, mathematics, science, and technology. However, turnover of key personnel contributed significantly to a level of program development that was lower than required to meet the local circumstances and to satisfy NSF's concerns. Additionally, there are some significant personnel issues at various levels in central office.

2. SYSTEMIC CHANGE DRIVERS

A. Policy

Are district policies in alignment with CPMSA goals? The Hartford Public School System established policy to ensure that a substantial number of under-represented minority students enroll in pre-college science and math courses. As of January 21, 1997, to receive a high school diploma from the Hartford Public Schools, students enrolled in high school after July 1997 with a projected graduation date of 2001 or later must successfully complete three credits in mathematics and complete the following courses as part of the three credit requirement: Integrated Math One (equivalent of Algebra One) and Integrated Math Two (equivalent of Geometry). Middle school students enrolled in grade eight after July 1, 1997 will be eligible to receive one high school credit for mathematics if all of the following criteria are successfully met: student was enrolled in Integrated Math One by October 1 of the current school year; student was in attendance on a regular basis for the current school year; student's average in Integrated Math One at the end of the year is 70% or higher; student receives grade of 70% or higher on standardized final assessment for Integrated Math One.

Also, to receive a high school diploma from Hartford Public Schools, the following requirement for science applies: students enrolled in high school after July 1997 with a projected graduation date of June 2001 or later must successfully complete three credits in science, and all students must successfully complete one science course with a lab component.

These policy changes are consistent with state requirements and include other aspects above and beyond the standard Algebra One concepts. The changes for science will be fully implemented in the 1998-1999 school year.

How do existing district policies impact the success rates of students in these courses? The recent policy changes for mathematics and science course requirements will raise the bar on academic success for all students, by establishing a higher level of performance as the standard. This will serve as an incentive for students to pursue higher achievement levels. However, there is an issue regarding implementation of the requirements. Despite efforts by central office administrators to clarify the course requirements, especially for high school mathematics teachers, some confusion exists regarding teachers' implementation of the integrated mathematics curriculum. Some of these teachers have chosen to work in other programs, rather than change their courses to reflect the new mathematics standards.

The Assistant Superintendent, Dr. Anna Cimochowski, responded to the issue by attracting mathematics teachers who have relevant expertise from other school districts. Meanwhile, current high school students will continue with their regular program of studies as planned. The new materials will be available to them as well as to the incoming students, but the older materials will be phased out as the new students proceed through high school.

CPMSA and other activities in Hartford Public Schools, particularly regarding partnerships, have increased opportunities for teachers' professional development in mathematics, science,

and technology. The overall effect should be an increase in students' achievement. Also, the district has adopted standards-based curriculum frameworks in math and science that are aligned with the CMT and CAPT and the technology implementation plan.

What policies exist that serve to facilitate equal access by all students in these courses? All students must successfully complete Algebra and Geometry. According to a mathematics chairperson, the district follows NCTM standards and Connecticut curriculum frameworks. The mathematics curriculum is organized into three levels: K-4, 5-8, and 9-12. The Saxon Mathematics Program, which is characterized by the mathematics chairperson as successful, will continue in grades K-4. Thus far, a cadre of 12 teachers has been trained in the use of the Saxon materials. These teachers meet once every other month with the author of the program, who resides in Connecticut. In two years, the Saxon program will be fully implemented.

In grades 5-8, the newly revised mathematics is not in place, because of Mr. Jimmy Hill's absence, due to personal health problems. Some preliminary work for the implementation phase has been completed, however, including outlining of topics to be covered and search for a new text book series that is consistent with the standards and curriculum frameworks.

Once the K-8 mathematics program is in place, work will resume on the high school curriculum. The Hartford Public School System's high school curriculum is aligned with national standards from NCTM and NRC, state curriculum frameworks and assessments, and local Academic Area Outcomes (PK-12). However, as indicated above, there are some issues with misunderstanding among parents and teachers.

Additionally, the mathematics chairperson implemented an assessment system for elementary schools which includes 13 written and 13 oral items. These 26 assessment items are standardized across all elementary schools and thus enable between school comparisons. The mathematics curriculum chairpersons wrote the criterion-referenced, objective-based tests in a manner consistent with the Connecticut Mastery Test for application in grades 2 - 6. The tests will be administered at the beginning, mid-year, and end-of-year. Results will be presented to teachers at the start of the year, in order to support prescriptive, skills-based teaching. This assessment procedure includes plans for all teachers to network with the district mathematics curriculum chairperson regarding the data base on students' achievement when the technology implementation plan is in place.

According to school district officials, 60% - 70% of the teachers are familiar with the NCTM (National Council of Teachers of Mathematics) standards for teaching mathematics. All elementary schools in the district are site members of the NCTM. Thus, teachers have access to the NCTM journals and may attend NCTM conferences at reduced rates. Elementary school building principals indicate their support of standards-based education in mathematics by allocating money for cite membership in NCTM. This widespread membership is significant in view of the fact that next year the regional NCTM conference will be held in Hartford. Thus, many of the elementary school teachers may attend the conference on mathematics teaching.

Another indication of the impact of CPMSA on building principals has been their tendency to contact the mathematics curriculum chairperson for assistance when they had questions about curriculum and instructional materials for teaching mathematics.

What district policies serve as incentives and rewards for teacher practices that support the goals and objectives of CPMSA? Curriculum Support Teams provided teachers at all levels and in all buildings with colleagues whowere identified as head teachers or lead learners, with responsibility for implementing the standards-based curriculum and assessment. Subordinate teachers may see these positions as incentives or opportunities for career advancement. Since the Curriculum Support Teams were implemented only recently, it is too early to assess its effectiveness.

A variety of awards and recognition affairs were available to teachers who demonstrated a commitment to implementing standards-based teaching and learning. Recognition of the contributions from teachers was the responsibility of the Director of Curriculum, Instruction, Assessment, and Professional Development; and the mathematics and science curriculum chairpersons. Also, there was a variety of rewards and recognition—including scholarships, stipends, and other incentives—from various outside organizations and industries, including the Connecticut Pre-Engineering Program (CPEP), United Technologies Corporation (UTC), Travelers Insurance, Loctite Corporation, the Connecticut Academy for Education, the Project to Increase Mastery of Mathematics and Science (PIMMS), and the Connecticut State Department of Education. In the second year of CPMSA, the Program Director established a "scholarship" program as an incentive to encourage teachers to participate in professional development programs sponsored by CPMSA.

B. District Leadership, Governance, and Management

How does the district superintendent set the vision and chart the direction of CPMSA? How does that vision align with the district's overall goals and objectives? The Superintendent of schools, Anthony Amato, serves at the pleasure of the State-appointed Board of Trustees for the Hartford Public Schools. His central office staff includes building administrators, teacher leaders, educational consultants and inservice agencies, and community partners. The goals and objectives of the Board of Trustees and the Superintendent's goals for the 1997-98 school year are mutually complementary and they are congruent with the goals and direction of CPMSA. The content and design of the Hartford Public School System's 1997-98 goals are suitable for district-level systemic education reform.

The 1997-98goals for the Board of Trustees were: to revise and appropriately publicize all Board policies by the end of the 1997-98 school year; to clearly articulate the roles and responsibilities of the Board, Superintendent of schools, and the school administration by November 30, 1997; to adopt a policy requiring that all school personnel be provided with job descriptions and an annual evaluation; to develop a policy regarding parental involvement in the schools by September 30, 1997, with the expectation that parent - teacher communication by letter, phone call or conference will occur on a monthly basis; to adopt

a policy to ensure that each school has a functioning school governance team, including representation of parents and community groups and defining the roles and responsibilities of the governance teams by November 30, 1997; to establish and maintain an effective working relationship with the Hartford City Council; and, in accordance with Special Act 97-4, the State-appointed Board of Trustees for the Hartford Public Schools will: oversee development of a long range facilities plan, based upon an updated enrollment projection, by June 30, 1998; oversee the development of a three-year technology plan, by December 1, 1997; oversee the development and implementation of a plan to deter opening week and habitual truancy, by September 1, 1997—a dropout prevention program will be developed by December 1, 1997, with goals set and monitored for each initiative; oversee the timely completion of all renovations and distribution of supplies and materials as needed to ensure the smooth opening of schools in September; oversee the successful implementation of the city/school system joint financial management and personnel systems, as well as progress in regards to joint process improvement projects, as of June 30, 1998; oversee a comprehensive budget analysis to identify cost savings, by March 1, 1998 to permit a reallocation of funds to meet appropriate education needs; oversee the completion of an audit of the school system's financial operations by January 1, 1998, as required by state statute; oversee alignment of the school system to the goals of the 49 Points for School Improvement ("District Improvement Plan"), by December 31, 1997, including identification of curricular requirements, determination of educational outcome goals, and establishment of guides and training programs as appropriate; oversee the increase in the percentage of Hartford children enrolled in early childhood programs, from the current rate of 39.1% to 50%, by September 1, 1998; oversee full engagement of local colleges, universities, and corporations to assist the school system in the accomplishment of its mission, by March 31, 1998; determine that significant progress has been made on each of the 48 Points of the District Improvement Plan, by June 30, 1998; and oversee adoption of a program of continuous improvement in student performance on annual state mastery tests, including review of periodic reports to the Board on test results and progress of the continuous improvement plan.

The Board of Trustees made substantial progress toward accomplishing each of these goals. For instance, the technology implementation plan was adopted. A decision was made recently to rebuild Hartford Public High School. There is a steering committee at the Hartford City Council to assist with review and improvement of the district's finance and management systems.

The Superintendent's 1997-98 goals for curriculum and student outcomes were: to create effective teaching strategies and greater learning opportunities in early childhood programs to ensure that students in pre-kindergarten through 3rd grades master basic literacy and math skills at the level of grade three, beginning September 1997; to increase student achievement in all Hartford public schools, as measured by the CMT and the CAPT, beginning September 1997; to implement an effective truancy policy by September 2, 1997, and to develop a dropout prevention program by December 1, 1997; to determine appropriate staffing for schools according to the approved school improvement plans, by February 1998; to distribute essential instructional materials and custodial supplies to every school, beginning August 15,

1997; and to establish support teams to ensure that all three district high schools are in compliance with the standards of the New England Association of Schools and Colleges, beginning September 1997.

The Superintendent's 1997-98 goals for parent and community involvement were: to expand opportunities for the meaningful involvement of parents and all sectors of the community, particularly in regard to improved attendance, discipline, and academic performance, beginning September 2, 1997; to define the role and responsibility of school governance teams and establish a pilot program for decentralized functions by October 31, 1997; and to undertake a positive and effective information and public relations campaign about student, parent, and staff contributions and accomplishments, beginning August 1997.

The Superintendent's 1997-98 goals for school organization and management were: to develop and implement a comprehensive instructional and management technology plan, by December 31, 1997; to establish a process for adoption and updating technology and textbooks through completion of a curriculum audit, beginning October 15, 1997; to design and implement a three-year comprehensive professional development plan for all employees, beginning October 15, 1997; to establish procedures for the review and revision of all job descriptions, by November 15, 1997; to pilot the new personnel evaluation instrument for teachers, beginning September 1997; to complete annual performance evaluations for all employees, by June 30, 1998; to establish effective systems of accountability for personnel and finances as measured by SmartStream technology and the Superintendent's chart of organization, beginning September 2, 1997; to assist and support an operational audit, in accordance with Special Act 97-4 to be completed, by January 1, 1998; to promote a safe and inviting school climate through the establishment of a three-year capital improvement plan and a maintenance accountability plan for all facilities, by June 30, 1998; and to monitor and assess the effectiveness of the service delivery model for greater assistance to students and staff through the clustering of schools and curriculum support teams, beginning September 1997.

One of the main reasons that Dr. Patricia Daniel was asked to step down as superintendent is that student data either was not presented to the Connecticut State Department of Education (CSDE), it was insufficient, or too late for statewide deadlines. A major task for the incoming superintendent will be to provide full report of student data in a timely fashion to the CSDE, so that progress toward the school district's goals can be measured. Thus, turnover of the superintendent created difficulty for assessing the accomplishments or effectiveness of this plan. The Board of Trustees intends to bring the district back on course relative to these goals and objectives, with Anthony Amato's appointment as the new superintendent for fall 1999. Progress may be at hand, since the superintendent's job description has been defined by the Board of Trustees. Also, the Board has now hired the superintendent of their choice, rather than working with someone who was hired by a different governing body under very different circumstances—such as occurred with Dr. Patricia Daniel.

To what extent do all relevant district stakeholders understand and accept systemic change as a strategy for improving science and mathematics education? The stakeholders in the Hartford CPMSA are the following: students, teachers, school administrators, parents, community leaders and civic organizations, other urban school districts in the state, social agencies, representatives from area business and industry, Project CONNSTRUCT and other systemic reform initiatives, science-rich institutions, State Department of Education, Governor and State Legislature, and citizens of Connecticut. Hartford is an urban priority school district and is the capitol city of Connecticut. Thus, there is substantial interest statewide regarding its improvement of students' achievement and there overall restructuring of the school system.

Awareness of systemic change and the goals of the CPMSA grant had improved, especially among teachers and building principals in the 14 targeted schools. Among the other constituencies, the awareness of CPMSA varied considerably, depending on linkages to systemic reform, generally. Thus, for example, the Connecticut Academy and the CSDE maintained a continuous interest in Hartford's progress toward CPMSA goals and provided assistance when called upon. Similarly, a number of partners were aware of the activities associated with or sponsored by CPMSA and regularly provided assistance. For example, CPEP attended all formal meetings of partners and provided service to teachers and students. Also, science and mathematics faculty at Central Connecticut State University, Saint Joseph College, and the University of Hartford provided workshops and other services to the district's students and teachers. Corporate sponsors provided support in the form of direct giving, consulting services, and various amenities.

Probably the largest issue for Hartford Public Schools during summer 1998 was the bargaining contract with the school teachers, which must be negotiated anew for fall 1998. The Board of Trustees was on record indicating its desire to make significant changes in the contract, including concerns for more parent - teacher interaction. The conditions for contract negotiation were new for both parties, since the district had never been in state receivership, with a state appointed Board of Trustees. A contract was approved by both parties.

Documentation from school and non-school personnel indicates that parents were gaining knowledge of the CPMSA program and its goals through OPMAD and other outreach efforts implemented during year two by the Program Director, Ms. Frances Sanchez. Teachers and building principals, especially in the 14 targeted schools, were more aware of CPMSA and its goals than they were at the end of year one. However, there was a substantial amount of work that needed to be done to inform and involve all relevant constituencies.

The goals and objectives of CPMSA were well-known to the following participants: principal investigators, program director, proposal writer, district curriculum chairpersons of mathematics and science, representatives from the Connecticut Academy and related systemic initiatives, members of the Board of Trustees, CSDE personnel, and teachers. Also, in the interest of improving communications about CPMSA, Ms. Sanchez developed and distributed brochures explaining the initiative's goals and objectives, written in Spanish and English.

Nonetheless, there was room for improvement with all communications, because many participants expressed concern for more direct involvement or for up-to-date information regarding operations associated with CPMSA.

How are staff informed of the goals and objectives of CPMSA? The Advisory Committee and the Academic Council were the main vehicles for transfer of information about CPMSA. In year two, the Program Director, Ms. Frances Sanchez, conducted more formal meetings with the teachers and building principals than were conducted during year one and, thus, she maintained a regular dialogue regarding the Hartford CPMSA, in general, its activities, and its progress toward accomplishing CPMSA goals, in particular. Indeed, one important difference between year two and year one was that Ms. Sanchez was an advocate for the initiative in Hartford Public Schools; the city of Hartford; and in Washington, D.C.

The mathematics and science chairpersons discussed CPMSA goals, objectives, and activities with inservice providers and staff during formal meetings. Of particular concern during 1997-98, was development and implementation of the 1998 summer enrichment program. Despite the serious issues surrounding the Hartford Public Schools' top level administration and management, the 1998 summer enrichment program—sponsored by CPMSA and, thus, free to Hartford's school children—was more fully developed than last year, was on schedule, and was available to many more students and teachers. Also, Hartford Public Schools received additional assistance from the state's funding in support of priority school districts and from the Connecticut Department of Labor for the summer enrichment program and various after school programs.

How are teaching, counseling, and administrative staff empowered to help lead systemic reform? The district's newly adopted organizational chart regarding the Hartford CPMSA project provided direct access by the CPMSA Program Director, Ms. Frances Sanchez, to the school superintendent, who was also the CPMSA Principal Investigator. Ms. Sanchez reported that her direct access to the superintendent made a significant difference in all matters pertaining to implementing the CPMSA. Indeed, year two of the Hartford CPMSA, particularly since Ms. Sanchez began her service as Program Director in late fall 1997, was characterized by more efficient and effective management, scheduling, and operations. There was still much work to be done in the name of systemic reform of the district's mathematics and science programs. However, Ms. Sanchez provided management and laid the foundation for accomplishing the CPMSA goals. Her leadership style emphasized management of all matters pertaining to implementing CPMSA according to the agreement with NSF. Ms. Sanchez relied upon the central office staff, mathematics and science curriculum chairpersons, project leaders, building principals, teacher leaders, and parent liaison personnel for all matters pertaining to standards-based curriculum, instruction, assessment, and community relations.

How are teaching counseling, and administrative staff given an opportunity to develop activities that are in alignment with these goals? How do you measure the effectiveness of these activities? Duties of counselors and other administrative staff are consistent with the organizational chart for the district and schools. The Hartford Public Schools are divided into

three areas, each of which has a Project Leader for all K-12 schools in the area. The Project Leader's responsibility includes supervision of all subordinates in the area. Effectiveness is determined by observation and evaluation of personnel in their regular duties. Overall effectiveness relative to CPMSA goals was assessed with measures of school enrollment, students' attendance records, course enrollment, and students' achievement on the CMT and CAPT. In the second year, there was evidence that high levels of student absenteeism continued as an issue, especially at the start of the school year. The CPMSA evaluation included a focus on each of these measures and results are in the TISC tables for the year-end report.

Professional development activities continued on implementation of the kit-based science program in the elementary schools, adoption of the Saxon mathematics program for all of the district's the elementary schools, Integrated Mathematics Series for the high schools, and afternoon workshops for teachers at the 1998 summer enrichment program. A system was designed and implemented for distribution of the kit-based science materials. Also, the CPMSA personnel were working with the Connecticut Academy, through its technical assistance program, for a more effective delivery of professional development activity in elementary science. As indicated earlier, there are issues associated with implementing the mathematics curriculum. In fall 1998, the emphasis shifted to the middle grades, where the curriculum is designed to prepare students for success upon entering high school where they will study the Integrated Mathematics Series. Plans for the 1998 summer enrichment program included many of the activities that were found to be successful in 1997, in addition to new programs.

How are the activities coordinated, managed, and communicated? The Project Director, Ms. Frances Sanchez, was chiefly responsible for management of all CPMSA activities. In the conduct of these duties, she relied on her full time secretary and other support staff. Also, Ms. Sanchez received assistance from the mathematics and science curriculum chairpersons for the district. Because the mathematics curriculum chairperson, Ms. Pamela Barker-Jones, had been in her position for approximately three years, and due to the wide range of her responsibilities in science, mathematics, and technology, she had been a valuable resource in most CPMSA activities. The school district's efforts to advertise the summer enrichment program were successful. Packets describing the enrichment program were distributed to every school and to every child. The Project Director and other central office personnel reported that they were inundated with requests from parents for more of these packets.

How do other Federal funds and private grants support the district's overall plan for systemic reform? The Connecticut Academy for Education, the Statewide Systemic Initiative (SSI) provided assistance to Hartford's initiative relative to teaching and learning of mathematics and science. The Academy provided a technical assistance team to the district on a wide variety of services and team members were in the four targeted school buildings on a weekly basis. Mr. Richard Cole, Executive Director, and Ms. Gemma Joseph Lumpkin, Director of Urban Technical Assistance for the Academy, both served on the CPMSA Governance Board.

United Technologies Corporation (UTC) provided substantial direct and indirect support for the CPMSA program. Dr. Tierney Temple-Fairchild, a UTC representative, served on the CPMSA Governance Board. UTC supports a variety of programs designed to improve the teaching and learning of science, mathematics, and technology education through its Hartford Education Initiative. One of UTC's successful initiatives is the Technology Learning Centers, in which day students receive instruction on computer and technology applications for learning and, at night, teachers and staff receive staff development programs for technology applications for teaching and other school-related uses.

Hartford Public Schools officials use federal funds from Title I and Eisenhower Title II Math and Science programs. There has been new funding for technology from the City of Hartford. The Connecticut State Department of Education provided grants, in particular, its Priority Schools Program helped support the summer 1997 academic enrichment program for Hartford's students. There was also funding from the Loctite Corporation for mathematics and science materials in the libraries at Dwight and West middle schools.

Funds that the Hartford Public Schools receives from the federal Goals 2000 initiative were used to support teachers' workshops at Fox Elementary School that were focused on science kits, language arts, and vocabulary development. These offerings were presented by staff from Saint Joseph College. Documentation indicates that teachers responded positively to this inservice program. Offshoots included teachers' development of higher levels of competency with technology and positive attitudes about scientific experimentation on the part of students and teachers. The Assistant Superintendent reported that CPMSA facilitated the development of a more cohesive approach to application for and management of external resources, such as federal funds.

In fall 1998, UTC presented officials from Hartford Public Schools and the University of Connecticut with a large grant to support technology training for teachers in Hartford. Previously, these workshops on technology training for teachers were provided by a local organization, CCET, which went out of business.

C. Standards-Based Curriculum

Which standards were adopted in the Hartford Public School System and why? The Hartford Public School System adopted the National Council of Teachers of Mathematics' (NCTM) and the National Research Council's (NRC) standards for curriculum, instruction, assessment, and professional development for mathematics and science. The national standards for mathematics and science are consistent with the standards, curriculum frameworks, assessment, and professional teacher training systems, including the Beginning Educator Support and Training (BEST) program developed and maintained by the CSDE. Finally, as a result of recently passed legislation in the Connecticut General Assembly, all public school teachers must receive 15 Continuing Education Units (CEU) focused on technology over a five year period of time. This latest requirement for CEUs is incorporated into the standard requirement of 90 CEUs, the state's professional development requirement which all teachers must satisfy every five years.

How do these standards relate to actual teaching practice? Elementary and middle school principals in the target schools reported that they and their assistants conduct annual evaluations of their staff. Additionally, building principals conduct informal visits to classes and participate in teachers' workshops and conferences. Documentation from building principals indicates that mathematics and science teaching was changing, due to implementing the Saxon math series and the kit-based science program. Curriculum chairpersons reported the same observations. However, due to retirements, new hires, and transfers of teachers, there is still need for more professional development programs for math and science.

At the three high schools, adoption of the Integrated Mathematics Series was an issue. Some secondary mathematics teachers preferred not to use the materials because they believed students are not adequately prepared for the concepts and skills. Also, participants reported that there were mixed messages from central office administration relative to implementing the new mathematics requirements. More work was needed in the high school area.

What model is used to disseminate standards-based curriculum throughout the Hartford Public School System? The district's office of Curriculum, Instruction, Assessment, and Professional Development is responsible for disseminating the standards-based curriculum in the Hartford Public Schools. The organizational chart has the Superintendent at the top and then central office personnel, including Project Leaders and Curriculum Chairpersons, followed by site teams of teachers, building principals, and central office personnel. The district chairpersons have primary responsibility for administering the Curriculum Support Teams—the new organizational structure for implementing the interdisciplinary curriculum. Lead learners are to persuade colleagues to share and cooperatively develop teaching strategies to improve students' achievement and motivation to learn. Staff meetings for professional development occur after school with small groups of teachers in monthly department meeting times and during site-based grade level meeting times.

In partial fulfillment of the 48 points for district improvement, Hartford Public Schools has implemented a new teacher evaluation program. The first phase, which is currently in operation, has elementary, middle, and high school administrators from three different schools engaged in training activity. In a short time, the program will be operating district wide.

Also, the Assistant Superintendent and the Acting Director of Curriculum, Instruction, and Assessment meet with teachers to obtain their responses about new materials and strategies for teaching mathematics and science at all grade levels. School administrators meet with the Superintendent on a monthly basis and report on professional development activities related to increasing students' achievement on the CMT and CAPT.

How does the Hartford Public School System use mathematics and science standards to motivate students who have traditionally been educationally under-served to pursue college programs in mathematics and science? The district's the new high school graduation policies in mathematics and science are a main means for encouraging K-12 students in Hartford to pursue higher levels of achievement and prepare themselves better for college programs in fields that require competency in mathematics and science.

D. Standards-Based Instruction

How do instructional strategies reflect a district philosophy that all children can learn challenging curricula at high levels? As indicated previously in the list of activities, the Hartford Public Schools system implemented a professional development program that included a large number of programs for K-12 teachers that concern mathematics, science, and technology. The focus emphasized hands-on activities, collaborative learning, technology applications, and criterion-referenced testing to provide students with ample opportunity for exploratory learning and development of specific skills. Teachers received feedback that was useful for prescriptive teaching.

Also, central office personnel said that—in the past—district policies on promotion and retention of students was very general. Now, any child who is falling behind in achievement will receive remedial services from the district through a variety of programs, including summer enrichment, extended day, extended year, and tutoring. These programs are integrated into site-based school improvement plans for each school, with the specific concern for all educators to address the issue of students who do not meet grade level criteria.

However, this was only the second year of CPMSA operations and, thus, the classroom impact was at an early stage. Nonetheless, there were positive results. Subsequent evaluations would need to focus documentation on the nature and extent of changes at the classroom level at elementary, middle, and high school levels.

How are teachers empowered to develop, implement, and share these strategies? The standards-based curriculum for mathematics and science is in place, generally. The district's professional development programs all emphasize the national standards and state curriculum frameworks. Also, the CMT and CAPT drive the curriculum and professional development programs, in a sense, because these are the state's standard tools to measure students' performance, particularly in mathematics and science. During 1997-1998, there were some shortages of building supplies, such as paper products, which led building principals to adopt innovative strategies to conserve paper and search for external support. However, elementary teachers and building principals reported satisfaction with the Saxon mathematics and the kit-based science programs.

What percentage of math and science teachers demonstrate knowledge of NCTM or NRC standards? How do you know this to be a fact? The mathematic curriculum chairperson reported that 100% of the district's teachers are aware of the NCTM or NRC standards, because the district has distributed these materials to staff. However, not all teachers apply the standards routinely in their teaching. Thus, staff development programs continue to emphasize the standards.

How do administrators and, in particular, principals support and facilitate the adoption of the best instructional models by all teachers? High school principals depend on their department chairpersons for development and implementation of standards-based mathematics and science programs. Also, depending on the faculty in a given high school, a building principal may rely on one or more other individuals on the mathematics or science faculties

for assistance with curriculum restructuring and professional development activity.

Elementary and middle school principals supported their teaching staff, especially in the core areas of the curriculum, as defined by the CMT. Frequently, elementary principals managed and delivered support services, including distribution of materials and training sessions. They attended workshops with their staff.

Thus, at the high school level, central office administrators communicate information regarding curriculum and instruction through the teachers. At the elementary and middle school levels, they rely on the building principal to communicate changes and updates to the teachers.

E. Standards-Based Assessment

Which criterion-referenced exams are administered district-wide? How do these tests inform classroom teaching and learning? Which norm-referenced exams are administered district-wide? What are the impacts on student placement? Connecticut law requires all districts to administer the CMT and off-level CMT for 4th, 6th, and 8th grade students each fall (The CMT includes mathematics, but does not include science.) State law also requires every school district to administer the CAPT, which includes science as well as mathematics, to 10th grade students each spring. Public School administrators at state, district, and building levels are taking steps to use achievement test results to assess the impact of curriculum and instruction on student learning. Because the data-based approach to decision-making is still in its infancy statewide, it is not possible to indicate the impact of achievement test results on teaching or students' learning and placement.

Are CPMSA students administered any additional exams? If so, why? Yes. Advanced Placement (AP) tests are available to high school students at Bulkeley, Hartford Public, and Weaver high schools on a voluntary basis. The purpose of AP testing is to offer Hartford students a challenge to pursue higher level knowledge in mathematics and science. The AP testing also provides awareness and opportunities for post-secondary education.

How are CPMSA periodic and annual assessments used to inform district teachers, counselors, and administrators about their roles in district progress toward CPMSA goals? The development and refinement of the data-based decision making model at the Connecticut Academy, is intended to provide all districts with up-to-date results and professional development for leadership training of school administrators. Currently, district chairpersons have responsibility to develop the means to evaluate the performance of staff in reference to the results from annual CMT and CAPT assessments.

How does the district respond to periodic and annual assessments that indicate improvement is needed? The 1998 report of statewide overall average CMT test results (released in February 1999) showed that Hartford Public Schools students scored at the lowest level on the CMT as compared to other cities in Connecticut. This news is particularly troubling in a year when CSDE is reporting a steady five-year increase in CMT results statewide. Data from social, economic, and educational studies indicates that Hartford is the poorest city in

Connecticut. In comparison to other school districts, Hartford Public Schools has the largest percentage (nearly 60%) of its students with a non-native English speaking background. Thus, the result of achievement testing is seldom good news. During 1997, there were indications in the CMT results that Hartford students realized incremental gains in mathematics achievement across the district. School district officials attributed some of this improvement to the successful implementation of the Saxon mathematics program. However, there were also reports of problems with the number of students who would take the CMT and those who were excluded from taking the test.

How are students informed of the student achievement goals and objectives of the program? During year two, the Program Director and her staff prepared and distributed brochures describing CPMSA. Also, OPMAD became a partner with the initiative, thus enhancing the outreach to the community.

How many students are achieving success in science and mathematics courses? It was too early to assess the impact of the CPMSA program on students' performance in mathematics and science.

How many students are showing greater interest in pursuing mathematics, science, and other technology-based careers? It was too early to assess the impact of the CPMSA program on students' interest and attitudes toward mathematics and science.

How many students are seeking and gaining admission to post-secondary education? We are not able to answer this question.

F. Professional Development

What percentage of teachers on elementary, middle, and secondary school levels have received in-service training? 100% of the teachers at all levels are required to take at least 18 Continuing Education Units (CEU) of professional development each school year. Central office personnel reported that most teachers exceed the requirement.

Are professional development activities ongoing, developmental, content-based, and constructively oriented? Yes. As indicated earlier in the list of activities, there is a professional development program for teachers, especially in mathematics, science, and technology. The district's staff development program, is planned, ongoing, and focused on standards-based teaching, learning, and assessment.

What percentage of teachers on each level has received more than three weeks of professional development? According to central office administrators, there are no teachers who accumulate three weeks of professional development activities. Most teachers accumulate between 20 - 80 hours for inservice time annually.

How do professional development activities take into account the diversity of student learning styles, while simultaneously adhering to standards-based outcomes? Hartford students' social conditions require the district to focus on different learning styles and the

district consistently addresses this issue. On average, students' reading and mathematics competencies are significantly lower than other localities, thus, lead learners, building principals, and district curriculum chairpersons encourage teachers to think of different approaches to instruction. There is emphasis on hands-on activities, calculators, computers, and discovery approaches, such as the kit-based science program.

What monitoring mechanisms do you use to determine if teachers have permanently changed their instructional practice? How often are teachers monitored each year, and who monitors teachers? The monitoring mechanisms are under development, as indicated in the Superintendent's goals for 1997-98. Thus far, they have not been implemented. District policy requires that each teacher have one observation by a supervisor each school year. For various reasons, approximately 20% of the district's teachers receive a second observation. The building principal and vice-principals conduct staff evaluations. In addition, all new teachers who are hired by the district must complete the state's BEST program, which includes six observations per year for two years. Successful completion of the BEST program requires teachers to develop a portfolio.

What are teachers' reactions to professional development programs? The CPMSA Program Director and central office personnel reported that teachers are generally positive about the district's professional development program. In fact, many teachers voluntarily attended evening and Saturday inservice sessions concerned with technology applications and methods or materials for mathematics and science teaching. The commonly expressed concerns of teachers pertain to the designated time for the events.

How does the district evaluate whether its investment in professional development results in a significant improvement in the ways that teachers teach and children learn? Central office personnel said that they assess the overall impact of teaching, administration, and professional development on the basis of students' annual results on the CMT and the CAPT.

G. Partnerships, Parental Involvement, and Public Awareness

1. Partnerships with Universities, Business, Industry, and Community Groups

Has the district developed a comprehensive strategy for broad-based support of CPMSA among all segments of the community? No. However, the Hartford Chamber of Commerce and other local agencies and organizations, including Project CONNSTRUCT, were laying the groundwork, in association with the Board of Trustees, to develop a more *organized* approach to systemic reform in the Hartford Public Schools.

What financial or in-kind services are provided by community based organizations, business and industry, and university partners involved in CPMSA activities? Include the number of providers and the amounts provided. The annual budget for Hartford Public Schools is approximately $200,000,000. A recent study of private and public giving indicated that cash contributions from other than local tax based support is $6,600,000. Also, there is $371,000 worth of in-kind services provided to the Hartford Public Schools. One of the Superintendent's goals for 1997-98 was to determine the sources, amounts, and intended uses of all soft money that comes into the Hartford Public School System.

What are the outcomes of the partnerships? UTC's Technology Learning Centers are providing staff development in technology applications to certified and non-certified staff in the Hartford Public Schools. The Connecticut Academy provided technical assistance for K-12 mathematics and science curricula. CPEP provided Summer Science Camps for students and professional development programs for teachers. There were also contributions from The Loctite Corporation to improve school library collections in mathematics, science, and technology, and to support science learning. St. Joseph College also provided inservice on teaching mathematics and science, especially in regard to the science kits. The University of Hartford assisted with technology education.

As a consequence of this staff development activity, there was improvement of building level use of technology and increases in professional development for teaching mathematics and science. During year two, there were fewer conflicts with subcontractors who provided various services to the district for CPMSA activities. Even though cutbacks were necessary, subcontractors were generally pleased with the way the Program Director managed affairs. Most activities went according to schedule.

What does each partner gain? Partners would gain assurance through implementation of CPMSA that systemic reform of mathematics and science was occurring in the Hartford Public Schools. Also, partners would gain leverage, because CPMSA was an organized and unified approach to reform of curriculum and instruction. To function well, CPMSA, required some review and realignment of resources and support systems. Thus, the current attention to the district's finance and management is important because it would help all parties and initiatives.

What do students gain from the partnerships? Some schools benefitted more directly than others. Thus, for example, due to additional support from UTC, South Middle, Moylan, and Weaver High School each have Technology Learning Centers for students, staff, and parents. However, all 14 targeted schools received direct benefits from the Hartford CPMSA. Year two was different from year on in that these services were more consistent.

What is the impact of these partnerships on the goals and objectives of the district's CPMSA? Partnering activity clarified and emphasized issues of leadership, management, and accountability for producing systemic reform of mathematics and science education in the Hartford Public Schools. The agreement between the Superintendent and the State-appointed Board of Trustees on the goals for 1997-98 and the "Forty-Eight Recommendations" and their relationship to the CPMSA program goals, in the least, helped to set the stage for systemic education reform in Hartford.

How are these partnerships managed, coordinated, and communicated, and how do they fit into the overall improvement plan? The CPMSA Program Director, Ms. Frances Sanchez, had chief responsibility for management of the partnerships involved with CPMSA. She worke in association with other officials at central office.

2. Parental Involvement

How does the district provide opportunities for parents to partner with the school in the education of the child? Every school has a parent liaison person, who is funded by Title I, whose job is to contact the parents. Also, every school building has a school governance team or site-based management team, which is 50% parents. Additionally, building principals and teachers organize parent nights, during which parents meet with their teachers and building administrators to find out about their children's academic progress. During year two, OPMAD provided special services to parents in the fall and spring, which were focused on science fairs.

How are the existence of parent involvement programs communicated to parents? In 1998, the Program Director published and distributed a brochure of the CPMSA program in English and Spanish.

How well attended are parent involvement programs? Elementary schools reported high levels of parent participation. During students' middle school attendance, parent involvement drops off. By the time the child reaches high school, parents seldom attend the school.

How are parents informed about mathematics and science education requirements and CPMSA program-related information? Increasing parent involvement was a constant concern of the CPMSA Program Director. On March 18, there was a large number of parents from different parts of Hartford in attendance during a superintendent's forum at Maria Sanchez School. The CPMSA Program Director was present and took advantage of this opportunity to give a warm welcome to all and to inform the parents of the CPMSA initiative, its goals and objectives, and the various activities that it makes available to students—in Spanish and English. She also announced details of the 1998 summer enrichment program. This outreach activity generated a significant amount of interest among parents and led to a large number of follow-up calls from parents to the central office. The was need for more attention to this area, including clarification by the central office administration to the teachers and the parents regarding the new graduation requirements.

3. Public Awareness

How has participation in CPMSA changed the way community organizations view the school district? Unfortunately, there are other very high profile issues in the Hartford Public Schools, such as the removal and appointment of the superintendent and school budget issues, which eclipse all other programs and activities. However, officials in community organizations would say that they are very pleased that CPMSA was being implemented in Hartford, particularly in the second year, because of the management provided by the Program Director.

How has participation in CPMSA changed the way universities view the school district? There was not much change in the university perspective. Since there was a stall in the implementation of the high school mathematics curriculum, Dr. Timothy Craine discontinued his services. A temporary relaxing of the emphasis on implementing the new mathematics curriculum would have allowed central office personnel to develop a new strategy for the

1998-99 academic year.

How has participation in CPMSA changed the way business and industry view the school district? Everyone had a wait-and-see attitude. Much depended upon who was hired as a new superintendent and what subsequent changes would be made in management and personnel. In regard to CPMSA, there was concern about the qualifications and work assignments of the district's mathematics and science curriculum chairpersons.

4. OTHER FACTORS

A. School/District Climate

How has the implementation of CPMSA changed the norms, values, ideals, and flow of communication throughout the district and within the organizational subsets, such as central office and schools? There was a modest influence, at best. CPMSA needed to build upon its accomplishments in the second year, especially. There was some progress in this area. The Program Director's direct access to the superintendent led to a more efficient and effective operation. Also, the addition of a full time secretary and use of support staff provided significant support. Thus, the stage was set for a greater impact on systemic reform issues in subsequent years.

However, CPMSA should have asserted itself more strongly as the unified force within the district for systemic reform of mathematics, science, and technology. More specifically, in the second year, the district's central office should have established and aggressively acted upon a plan for implementing CPMSA—in full cooperation with its partners—in order to convince the local constituents and NSF officials that Hartford Public Schools had a serious commitment to systemic education reform.

B. Attitudes of Teachers and Other School Staff

How has the implementation of CPMSA improved the way teachers, counselors, principals and other school staff feel about their jobs? See Section 6 Attachments, C. Survey Analysis.

C. Student Attitudes

How has the implementation of CPMSA changed the way students feel about their teachers and their school? See Section 6 Attachments, C. Survey Analysis. Anecdotal information suggests that students enjoy the hands-on activities and opportunities to use technology, namely the computer and graphing calculators, for learning and school-related products.

D. Parent Attitudes

What do parents of participating students feel about the goal of CPMSA, their chances to help support these goals, and their involvement in their child's education? See Section 6 Attachments, C. Survey Analysis.

E. Student Enrichment Activities

By what process does the CPMSA ensure that student enrichment activities will result in enrollment and successful completion rate increases in higher level math and science courses? The Connecticut Academy is in the process of developing a data-based management system. Currently, this documentation is being collected and analyzed by a computer systems analyst.

What percentage of CPMSA program students are directly involved in enrichment activities? All of the students at the 14 target schools received the invitation to participate in the 1998 summer enrichment program. Applications outnumbered the 900 slots available.

What are student reactions to the enrichment programs? The 1997 summer enrichment program was described by participants as "a great success"—for students and teachers. Since the 1998 summer enrichment program was based upon the work done in 1997, and the enrollment figures were high, everyone expected to find similar results in 1998. For a discussion of summer enrichment program results, see Appendix, Survey of CPEP Summer Program.

5. SUMMARY

Documentation on year two of the Hartford CPMSA revealed a different and more effective form of implementation than occurred during year one. The appointment of Ms. Frances Sanchez as full time Program Director—with direct access to the superintendent—made a positive difference. Due to her management, there was a timely scheduling of activities, hiring of subcontractors, revision of the budget, and completion of work. Central office personnel attributed the district's accomplishments in mathematics and science programming, especially during the past year, to the focus provided by the goals and objectives of CPMSA.

The most significant issues associated with CPMSA stem from ongoing problems in the school district. During these two years, there was chaos in the Hartford Public Schools that made it difficult for CPMSA's operations to unfold as they were planned. The issue of implementing the new high school course requirements is a case in point. Accreditation of Hartford Public High School is another item. Strategic planning, development, and operations for CPMSA were lacking.

However, the most important issue in the 1997-98 school year was removal of the former superintendent, appointment of a two interim superintendents, and the eventual hiring of a new permanent superintendent. Turnover in leadership at the highest level in the Hartford Public Schools—while similar to other urban centers nationally—has been far too frequent for stability and consistency. Recent articles in the *Hartford Courant* indicate that Superintendent Anthony Amato is an excellent choice to lead the district out of the morass. Sadly, CPMSA's resources will not be available to the new superintendent. Nevertheless, keynoting the city's most serious issue in regard to public education, Mr. Amato has promised the Board of Directors and the CSDE that "Hartford will not be last at this time next year, and we will never be last again."

From the start, key partners in the greater Hartford community expressed strong support of the CPMSA initiative and all related efforts for systemic reform of mathematics and science. Indeed, there were indications that 1997-98 would be a watershed year in the Hartford Public Schools. The appointment of a new permanent superintendent by the Board of Trustees and the impetus for process improvement from various civic and social agencies, corporate sponsors, and the Statewide Systemic Initiative all contributed to an overall expectancy for positive change. The three high schools were developing Centers of Excellence, which would provide opportunity for students to enroll in academies where—in addition to their core academic courses—they would receive specialized instruction in allied health, classical studies, finance, or technology.

It is rare that substantive change is without problems—no matter where it occurs. Also, a particular school system's response to its recurring problems is as important as the new initiative itself. The documentation collected for this evaluation made it clear that there was a thread of program development in the areas of mathematics and science education. Unfortunately, Hartford Public Schools had not fully committed itself to CPMSA. Nor did the district fully embrace systemic reform.

In the mid-year report of CPMSA accomplishments, CRE advised school district leaders that the most important next step should be establishing CPMSA more distinctly as *the district initiative for the reform of K-12 mathematics and science* (emphasis in the original). Also, CRE advised that a vital coalition of the superintendent of schools, private sector partners, SSI, and other civic and social agencies should be empowered to propel CPMSA to the position of an internal agency with direct responsibility for implementing this systemic reform in these curricular areas. The response from the district was too little and too late.

By the end of year two, CPMSA was not seen by outsiders as a significant player in the systemic reform of mathematics and science in Hartford. There were too many unanswered questions about the district's management and leadership, relationships with CSDE, and partnerships with the private sector—particularly in regard to CPMSA's goals, objectives, strategic planning, and operations. Indeed, there was much more work that had to be done on most aspects of the initiative.

It is plausible that Superintendent Amato will marshal the resources and will reassemble the partners from public and private sectors for a much more timely, consistent, and effective focus on mathematics, science, and technology education in Hartford. NSF has demonstrated its long-term commitment to Connecticut through SSI and to Hartford, in particular, through CPMSA. With a revised strategic plan and with firm, wide-spread commitments from all key players—including accountability for expected results—perhaps the district will be able to capture the attention of and the resources of NSF, once again. CRE strongly encourages NSF, the school district, and the local partnership to take immediate action in this direction—for the children in Hartford, CT.

6. ATTACHMENTS

A. Methodology

Methods of data collection consisted of interviews with key players, including the CPMSA Program Director; mathematics and science chairpersons; the Interim Superintendent; building principals of targeted schools at elementary, middle, and high school levels; lead teachers for mathematics and science; and classroom teachers. Also, CRE interviewed the CPMSA's principal partners in the greater Hartford area. Included were representatives from business and industry; colleges and universities; parents; inservice consultants and providers, such as the Project to Increase Mastery of Mathematics and Science (PIMMS); Project CONNSTRUCT, the Statewide Systemic Initiative; and the Connecticut State Department of Education.

In some instances, CRE followed the list of questions supplied by the National Science Foundation (NSF). In other instances, the principal evaluator asked: What are the most important accomplishments of Hartford's CPMSA in year two? What, if any, are the substantive issues or problems associated with the second-year implementation of the Hartford CPMSA? Please describe your involvement, if any, in the Hartford CPMSA?

Another source for data was the collection of documents produced by central office personnel, committees, and lead teachers. CRE reviewed reports, curriculum materials, and other relevant documents.

B. TISC Tables
(See Appendix)

C. Survey Analysis

This section of the report presents results of three linked surveys conducted for Hartford's CPMSA grant. The primary purpose of the surveys is to assess the perspectives of teachers, parents, and students regarding education in Hartford Public Schools, especially in the areas of mathematics and science. A secondary purpose is to gather data on specific educational indicators to provide administrators and educators with information on how well the schools are meeting the expectations of teachers, parents, and students.

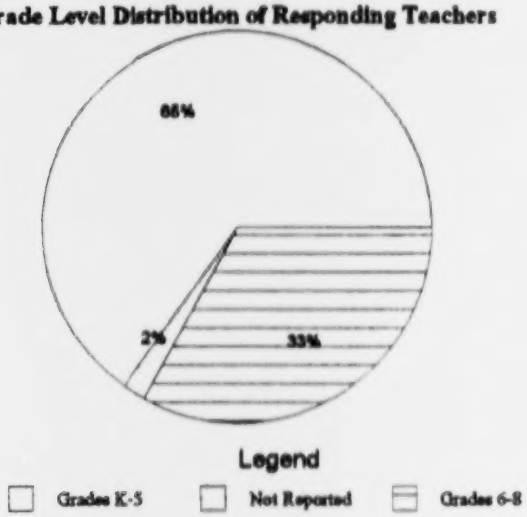
This assessment was conducted by developing three linked surveys for elementary and middle school participants involved with CPMSA. The three surveys were submitted to the Project Director for distribution to participating classroom teachers throughout the district. Classroom teachers administered the student survey, completed the teacher survey, and provided each parent with a parent survey for self-administration. The completed surveys were collected by the classroom teacher and returned directly to Curriculum Research and Evaluation. Specific data on the actual number of classroom teacher, student, and parent surveys that were distributed for this study are unavailable.

A total of 59 classroom teachers, 140 parents, and 370 students completed the survey. Using estimates, based on the total number of participating K-8 students, this represents a return rate of approximately 15% for teachers, 1% for parents, and 3% for students relative to the total population. Although specific totals are unavailable, it is reasonable to assume that the Project Director distributed the survey to a subgroup or sample of the total population. If this is true, the approximate return rate for each group would in reality be higher. Although sampling is no guarantee of scientific generalizability, the data collected does warrant serious attention, since the responses returned in a undefined survey distribution typically reflect the views of those respondents who have the strongest opinions on the subject.

1. Demographics of Classroom Teachers

A total of 59 K-8 classroom teachers from the Hartford Public Schools responded to the survey. A majority are K-5 classroom teachers working with all the subject areas. A small percentage of those teaching at the middle school level classify themselves as math or science teachers only.

Grade Level Distribution of Responding Teachers



Grade Level	% of Subgroup of Teachers*
1	28%
2	34%
3	14%
4	25%
5	17%

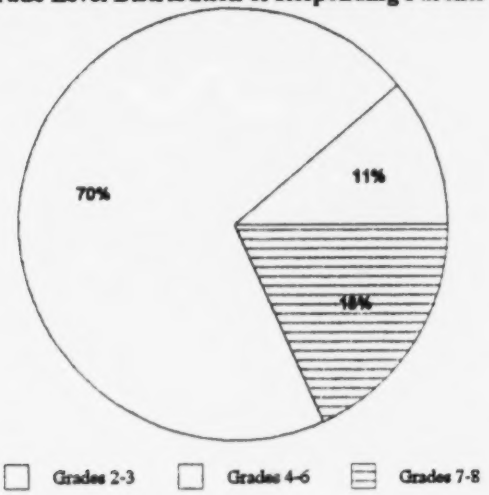
Grade Level	% of Subgroup of Teachers*
6	41%
7	59%
8	35%

*includes teachers in multiple grade levels

2. Demographics of Parents

A total of 140 parents with children in the Hartford Public Schools responded to the survey. A majority are parents of upper elementary school students in grades 4-6. The remaining group of parents have children in grades 2-3 and 7-8, with a slightly greater number at the upper levels.

Grade Level Distribution of Responding Parents



Grade Level	% of Subgroup of Parents
2	1%
3	18%

Grade Level	% of Subgroup of Parents
4	44%
5	38%
6	56%

Grade Level	% of Subgroup of Parents
7	18%
8	24%

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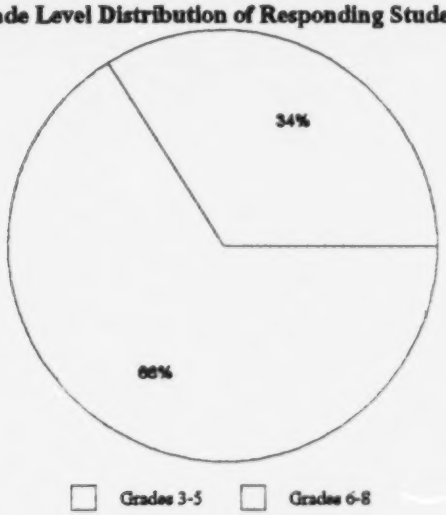
3. Demographics of Students

A total of 370 grade 3-8 students responded to the survey. A majority are middle school students in grades 6-8. The response group includes more girls than boys.

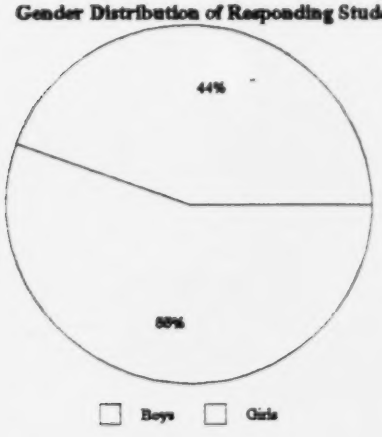
Grade Level Distribution of Responding Students



Grade Level	% of Subgroup of Students
3	3%
4	11%
5	20%

Grade Level	% of Subgroup of Students
6	24%
7	18%
8	24%

Gender Distribution of Responding Students



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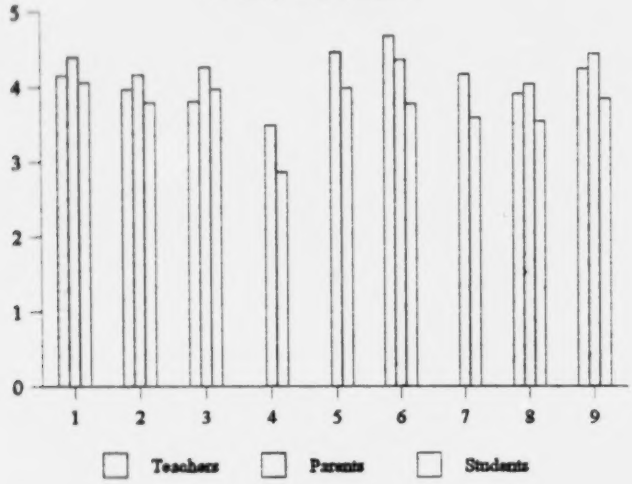
4. Issues of Safety and Comfort

The survey asked respondents to rate on scales from 1 to 5, with 5 as always and 1 as never, their perspective on a number of school safety and comfort issues. In almost all cases, the average parent response was higher than the other groups, while the students most often rated each item lower than the others. The data shows that the responses of each group were similar on most items. Differences were evident in the teachers' perceptions of their work to cause students to behave, which was higher than the perceptions of the other groups. Also, teachers and parents rated the student's enjoyment of school higher than was indicated by the students. Across subgroups, grade distributions had the most noticeable effect on the responses, with teachers, parents, and students at the K-5 level rating almost every item higher than those at the middle school levels.

Safety and Comfort



Item No#

1. Do you (student) feel safe inside the school?
2. Do you (student) feel safe on school grounds?
3. Do you (student) feel safe going to and from school?
4. Does the staff do a good job keeping restrooms clean?
5. Does the staff do a good job keeping the lunchroom clean?
6. Do teachers do a good job getting students to behave?
7. Are the school rules fair?
8. Are the school rules enforced?
9. Do you (student) enjoy coming to school?

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Safety & Comfort: Comparisons of Responses according to Grade Level Distributions						
Item No#	Teachers		Parents		Students	
	K-5	6-8	K-5	6-8	K-5	6-8
1	4.29	3.76	4.54	4.17	4.38	3.87
2	4.06	3.82	4.28	4	4.15	3.58
3	3.86	3.59	4.39	4.06	3.98	3.93
4	[illegible]	[illegible]	3.6	3.20	3.16	2.66
5	[illegible]	[illegible]	4.69	4.17	4.23	3.87
6	4.09	na	4.48	4.22	4.23	3.52
7	[illegible]	[illegible]	4.2	4.17	4.03	3.34
8	4.2	3.59	4.14	4.17	3.59	3.51
9	4.26	4.12	4.51	3.90	4.08	3.7

Item No#
1. Do you (student) feel safe inside the school?
2. Do you (student) feel safe on school grounds?
3. Do you (student) feel safe going to and from school?
4. Does the staff do a good job keeping restrooms clean?
5. Does the staff do a good job keeping the lunchroom clean?
6. Do teachers do a good job getting students to behave?
7. Are the school rules fair?
8. Are the school rules enforced?
9. Do you (student) enjoy coming to school?

5. Parental Inclusion

Using the 1 to 5 scale, teachers, parents, and students were asked to rate the school's openness toward parental involvement in their child's education. In most cases, the average teacher response was higher than the other groups, while the students most often rated each item lower than the others. The data shows that parents' perception of the information they receive about school activities, access to the principal, and impact of their views was lower than the teachers' perception of parental impact on these areas. Conversely, parents felt more welcomed and involved in their child's education than the teachers' perceived them to be. Additionally, across subgroups, grade distributions had the most noticeable effect on the responses, with teachers, parents, and students at the K-5 level rating almost every item higher than those at the middle school levels.

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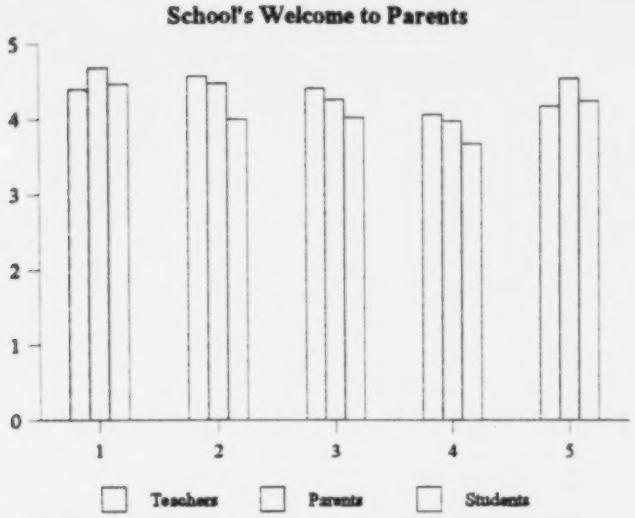

Item No#
1. Are you (parents) welcome at your school?
2. Do you (parents) get enough information on school activities?
3. Can you (parents)talk with the principal about problems?
4. Can you (parents) make a difference with your views?
5. Can you(parents) get involved in your child's education?

Parental Involvement: Comparisons of Responses according to Grade Level Distributions

Item No#	Teachers		Parents		Students	
	K-5	6-8	K-5	6-8	K-5	6-8
1	4.59	4	4.85	4.45	4.73	4.37
2	4.74	4.18	4.56	4.34	4.17	3.91
3	4.59	4	4.33	4.19	4.22	3.91
4	4.24	3.75	3.96	3.92	4.14	3.44
5	4.32	3.8	4.61	4.47	4.44	4.16

6. Motivate student learning

Teachers, parents, and students were asked to use the 1-5 scale to rate their perception of the classroom teachers and the schools' expectations, assistance, and encouragement towards the improvement of student learning, especially in math and science. In all but one case, student response was lower than the other groups. The exception was in the school's efforts to improve students' skill with a computer which was rated the lowest by teachers. Responses of teachers and parents were similar on most shared items. An exception was in the school's encouragement of students' increased ability to solve problems, which was rated higher by

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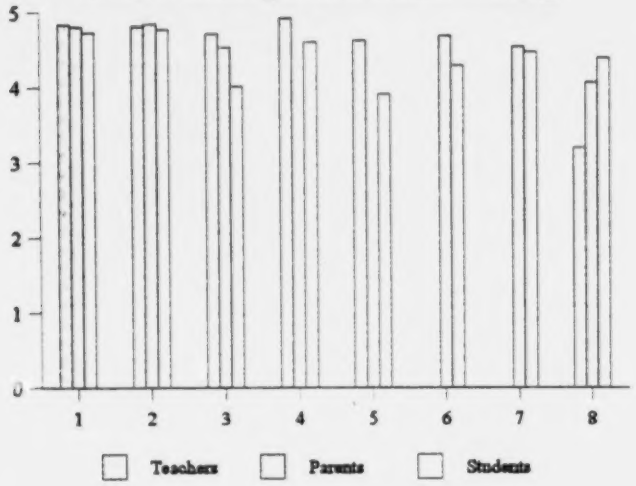
teachers than parents. Responses across subgroups were similar. Grade distributions had the most noticeable effect on the responses, with teachers, parents, and students at the K-5 level rating almost every item higher than those at the middle school levels. Each respondent was also asked if the school assigned enough homework. The majority of each group responded with yes. A low percentage in each group felt the best choice was no, while the percentage selecting too much was largest in the student group.

School's Encouragement of Student Learning



Item No#

1. Do teachers expect you (students) to do your best?
2. Do teachers expect you (students) to behave?
3. Do teachers help you (student) be a problem solver?
4. Do teachers encourage you (student) to do your best?
5. Do teachers provide lots of ways to show what is being learned?
6. Does the school try to improve your math performance?
7. Does the school try to improve your science performance?
8. Does the school try to improve your skill with computers?

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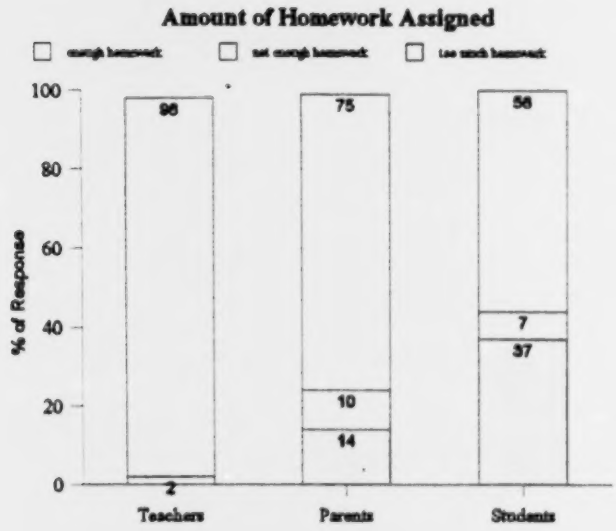

7. Reporting on Student Performance

Each group was asked to use the 1-5 scale to rate how well teachers keep parents and students informed of their progress. Responses were similar across the three groups, with students rating the lowest on most items. Teacher responses were highest on items indicating that students received enough information on assignments, tests, and how well they were doing. Parents' perceptions were highest in areas in which teachers made students aware of what they need to do to improve performance in math and science. Across subgroups, the greatest difference in responses was evident between math, science, and other subject or classroom teachers. The highest rating provided by math teachers was on how much they explain what students need to do improve in math. Teachers whose responsibilities extend beyond math and science rated how often they tell their students how well they are doing higher than other teachers. Science teachers felt they provide more information on assignments, tests, and how to improve science performance.

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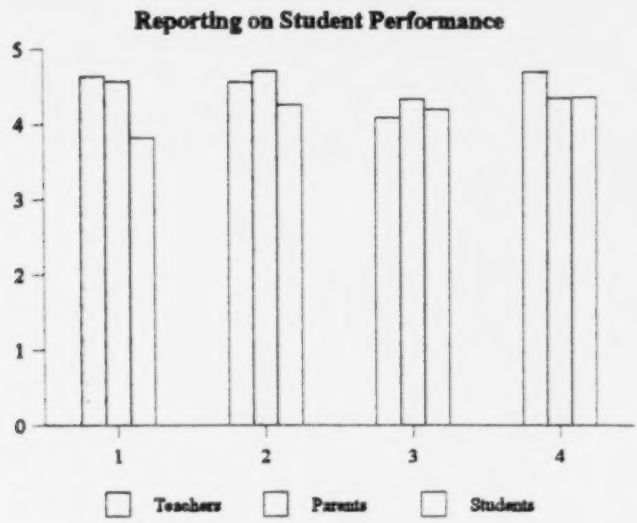


Item No#
1. Do teachers tell you (students) often how well you are doing?
2. Do teachers tell you (students) what you need to do to improve in math?
3. Do teachers tell you (students) what you need to do to improve in science?
4. Do teachers give you (students) enough information to do well on assignments and tests?

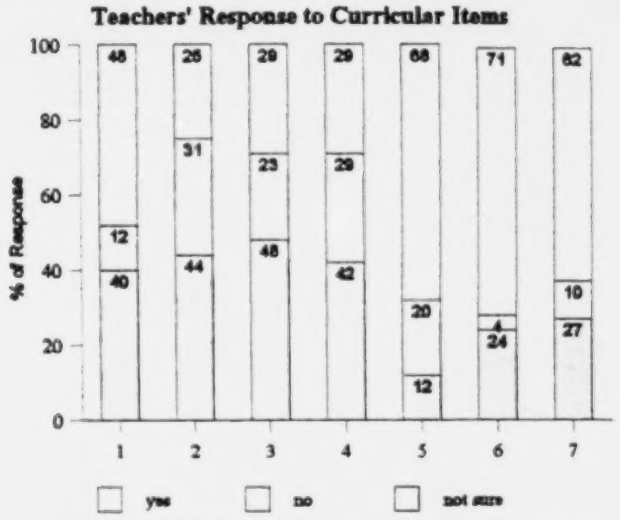
Reporting on Student Performance: Comparisons of Teacher Responses according to Subject Area

Item No#	Math Teachers	Science Teachers	"Other" Teachers
1	3.5	4.3	4.78
2	4.5	3.67	3.67
3	4	4.67	3.5
4	4.5	5	4.44

8. Teachers Perceptions of Curricular Issues

Participating teachers were asked to answer additional questions about the district's curriculum and instruction, especially in science and math. Teachers were asked a series of questions requiring a yes, no, or not sure response on the structure and development science and math curricula. In the majority of cases the teachers were often unsure of the appropriate response. On items regarding teachers' use of effective strategies, the majority responded with yes answers. A difference in response was evident in this area among the grade level subgroup. In general, middle level teachers were more aware of the developmental issues

regarding the curriculum and with teachers' use of effective strategies than were the K-5 teachers.



Item No#
1. Is the math curriculum based on NCTM standards?
2. Do you have team that develops standards based curriculum in math?
3. Is the science curriculum based on NRC standards?
4. Do you have team that develops standards based curriculum in science?
5. Are teachers empowered to develop and share effective teaching strategies?
6. Are there teachers who use effective strategies to improve math performance?
7. Are there teachers who use effective strategies to improve science performance?

Curricular Issues: Comparisons of Percentage of Teacher Responses according to Grade Level

Item No#	Grades K-5			Grades 6-8		
	yes	no	not sure	yes	no	not sure
1	46	6	43	33	25	42
2	14	34	46	58	17	25
3	27	27	47	36	9	55
4	24	32	44	55	9	36
5	64	24	12	82	0	18
6	65	6	29	82	0	18
7	53	9	35	82	0	18

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9. Summary

There was a high level of agreement in all areas among teachers, parents, and students, with the latter consistently providing a lower rating than the others. With mean ratings ranging from approximately 3.5 to 4.5 in all areas, it seems that all groups feel safe and comfortable at school, that parents feel welcome, that the teachers are helping students learn, and that information on student progress is being provided. In each area, especially at the middle school levels, there is room for improvement. Nonetheless, the school district, from this limited data source, seems to have a solid base from which to start. An item in which the district should take close notice is in the improvement of computer skills, which received low ratings from all groups. It also seems evident that the district needs to provide teachers with a common base of understanding on the basis for the curriculum standards and curriculum development procedures for their building and for the district.

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D. Survey of CPEP Summer Program

CPEP, Inc.

Discovering the Powers of Mathematics, Science and Engineering

Summer Enrichment Program
1998

INTRODUCTION

This evaluation of the 1998 CPEP Summer Enrichment Program in Mathematics, Science, and Engineering is part of a larger evaluation of the Hartford Public Schools 1997-1998 Comprehensive Partnership for Science and Mathematics Achievement Grant (CPMSA). Curriculum Research and Evaluation serves as the external evaluator of the CPMSA Grant investigating all components of the grant including the sponsorship of the Summer Enrichment Program. The methods of data collection included attendance at meetings, informal interviews of key participants, and surveys of participating teachers, parents, and students. The data was analyzed to determine themes, mean ratings, and frequency counts. The findings and recommendations presented in this evaluation of the CPEP Summer Enrichment Program are based primarily on specific survey data collected from teachers, parents, and students participating in the 1998 summer programs.

PROGRAM DESCRIPTION

CPEP, Inc. is a collaboration of school districts, businesses, colleges, universities, government, and community organizations that provides programs and activities throughout the year in eight urban areas in Connecticut. The mission of CPEP is to increase the number of underrepresented minority students who pursue mathematics, science, engineering, and other technologically based college degrees and careers. One ongoing component of the CPEP program is the Science Camp at Trinity College. In the summer of 1998, as the program began its eleventh year, it was expanded to include a pilot program, Discovery Engineering. These two programs, housed at Trinity College, formed CPEP's 1998 Summer Enrichment Program.

The Summer Enrichment Program is a five-week science-based program which offers "hands-on" learning opportunities in biology, chemistry, math, language arts, computers, and career guidance. The programs are designed to increase the interest of middle and high school aged students from the Greater Hartford area in science, mathematics, and engineering. They are designed to promote positive attitudes about learning mathematics and science, to improve academic achievement, and to increase awareness of post high school education and careers. The curriculum is lively, applicable, relevant, and integrated. In addition to the math and science focuses, there is a strong language arts component as well as emphasis on study and coping skills.

This interdisciplinary "hands-on" approach has been the primary design for the Science Camp since its inception. These methods and approaches were also used in the Discovery

Engineering Program which was piloted for high school students. Both programs are rigorous and provide students with a holistic look at science and mathematics in ways not offered to students during the regular school year. In order to ensure the highest level of success for participating students, the Summer Enrichment Program provides support systems, including enrichment activities, field trips, career counseling, and academic tutorials administered by undergraduates at Trinity College. In addition to the activities in the science, mathematics, and computer labs, students develop study and research skills, and work to improve their written and spoken communication. Emphasis is also given to career planning, including identifying academic needs and interests, and becoming familiar with financial aid and academic requirements.

The students selected to participate in the Summer Enrichment Programs are underrepresented minority middle school (Science Camp) and high school (Discovery Engineering) students from the Greater Hartford area who possess a strong interest in science and mathematics. Although all students in the greater Hartford area are eligible to apply, most of the students are recruited from CPEP's school year programs. In order to be admitted to the program, students must have at least a B- average, be involved in some form of academic extracurricular activity, and have maintained an 80% attendance record during the school year. Students must also express, during a personal interview, an interest in mathematics, science, technology, or engineering, related career goals, and a commitment to work during the five-week program.

METHODOLOGY

The data collected for this evaluation study consisted entirely of quantitative and qualitative data from surveys of teachers, parents, and students participating in the 1998 Summer Enrichment Program. The *Teacher Survey* focused on the organization of the Enrichment Program and its impact on students, professional development, and teaching and learning. The *Parent Survey* and *Student Survey* instruments were designed to link data on the students' perceptions and the programs' impact. Survey results are presented and organized both by program and by participant group.

ANALYSIS OF DATA

Teacher Surveys. Six teachers responded to the self-administered survey. They were evenly divided between the Science Camp Program and the Discovery Engineering Program. The majority, 67%, were male full-time classroom teachers. As a group, the teachers were equally divided between the middle and high school levels with an average of 23 years of teaching experience. Overall, the teachers rated the management of the Summer Enrichment Program very high. Rated equally high were items on classroom space, field trips, and respect for teachers' need to plan both independently and collaboratively. In general, the teachers indicated that the science component of the curriculum had the greatest impact on student learning. They identified the most valuable lesson learned by the students as the understanding of the importance of mathematics and problem solving to science inquiries. Professionally, the teachers gained a deeper appreciation for the other disciplines and their relationship in an integrated curriculum. They also gained renewed faith in young people and their determination to learn and succeed.

Parent Surveys. Thirty parents responded to this survey. The majority, 83%, had students enrolled in the Discovery Engineering Program. Sightly more than half of the parents, 57%, reside within Hartford and send their children to the Hartford Public Schools. The remainder live in the Greater Hartford area and attend other public school systems. Almost all parents reported that their children attended the program every day, enjoyed it, and had fun. Given an open item to explain why they had decided to enroll their child in the program, the majority of responses included: (1) provided an academically oriented activity during the summer; (2) provided new opportunities and benefits for the future; (3) provided an opportunity to learn more science and math while meeting new teachers and peers; and (4) matched children's desire to learn more about computers and engineering. According to the parents' responses, the most valuable information and skills gained by their children over the five-week period included an understanding of electricity and robots; an increased confidence with public speaking; an increased awareness of career and college options, and practical information on how to write resumes and set career objectives. The majority, 50-60%, indicated in their responses that they felt the amount of homework was appropriate and that the tutors were very helpful. Components of the program in which students were expected to behave and do their best were also highly rated, as was the teaching staffs' interest in providing students them extra help, showing them how to learn and to share their knowledge, and promoting academic challenges and achievement. All parent had high praise for the Summer Enrichment Program. As a result, when asked on the survey to grade the program, 70% selected the grade of A.

Student Surveys. A combined total of 39 students responded to the survey. The majority of them, 56%, are female. Their ages range from 13 to 17, with the average at slightly more than 14 years old. Grade ranges were between ninth grade and eleventh grade, with 44% in the tenth grade and the remainder equally divided between ninth and eleventh grade. A large majority, 81%, of the responding students attended the program every day for five weeks. For those not maintaining a perfect record of attendance, no one missed more than two days. Most of the students, 88%, enjoyed the program, with 75% indicating that they had fun most or all of the time. Overall, students' favorite component of the summer Enrichment Program was the opportunity to participate in field trips. The majority, 72 - 82%, felt the homework was appropriate and that the tutors were helpful. Most of the students, 77%, indicated that the Summer Enrichment Program had prepared them for their next level of education and initiated thought of career options. As a group, the students had high praise for the Summer Enrichment Programs as indicated by the selection of grades of A or B by 90% of the responding students.

Science Camp - Discovery Engineering

Teacher Surveys. Overall, the Science Camp teachers rated the management and design of the program as high, with means ranging from 4-5 on a scale from 1 to 5. Survey results show some concern with the assignment of teaching duties and with the timing of program advertisements distributed to parents. The item of greatest concern to these teachers was the timing of the hiring process which received the lowest ratings. Teachers from the Discovery Engineering Program provided equally high ratings to 8 of the 15 items concerning management and design. Their responses showed concerns similar to those expressed by the

Science Camp teachers. In addition, data collected from these teachers, showed concerns about the instructional technologies, field trips, the need for collaborative planning, and the match between students' academic needs and the class assignments. (Figure 1)

Figure 1

Survey Items: Program Management and Design	Mean Ratings	
	Science Camp	Discovery Engineering
Overall management of the program	4.67	5.00
Advertisement to parents regarding the summer program	3.33	2.00
Enrollment of students	4.00	4.00
Assignment of students to classes and/or teachers	4.33	2.50
Extent to which program design matches students' academic needs	5.00	2.50
Disciplining students for inappropriate behavior	4.33	4.00
Timing of teachers' hiring	1.33	1.50
Assignment of teachers to teaching duties	3.33	1.50
Teachers' needs for independent planning	5.00	4.50
Teachers' needs for collaborative planning	5.00	3.50
Classroom space	5.00	4.00
Classroom furniture	4.00	4.50
Instructional materials	4.33	4.50
Instructional technologies	4.33	2.50
Field trips	5.00	3.50

Assessing the program on its attention to professional development concerns, showed that the Discovery Engineering teachers considered this to be nonapplicable to their program except in the area of interdisciplinary curriculum which received a 2.5 mean rating on a scale of 1 to 5. Data collected from the Science Camp teachers resulted in low ratings in all areas, with means ranging from 1.33 to 1.67. (Figure 2)

Figure 2

Survey Items: Professional Development	Mean Ratings	
	Science Camp	Discovery Engineering
Teaching mathematics	1.67	.00
Teaching science	1.67	.00
Teaching reading	1.67	.00
Teaching writing	1.67	.00
Interdisciplinary curriculum	1.67	2.50
Use of technology: hardware	1.33	.00
Use of technology: software	1.33	.00

Differences in teacher perceptions were also evident in their responses to items focusing on the programs' impact on student learning. Given eight academic areas and attitudes, the Science Camp teachers indicated that the students were positively impacted by each area with mean ratings ranging from 4 to 5. The Discovery Engineering teachers indicated that the areas of math, reading, and writing were nonapplicable and that the impact of all other listed areas and attitudes was average. (Figure 3)

Figure 3

Survey Items: Student Impact	Mean Ratings	
	Science Camp	Discovery Engineering
Math	4.33	.00
Science	5.00	2.50
Reading	4.33	.00
Writing	4.33	.00
Technology use	4.33	2.50
Career interests	4.00	2.50
Transition to secondary education	4.33	2.50
Importance of finishing high school	5.00	2.50
Attendance at post secondary school of choice	5.00	2.50

Summary: It is evident from the data collected that the focus, expectations, and outcomes of these two programs vary for each group of teachers. The Discovery Engineering Program

is a science and technology-based program that promotes educational and career options for students. Teachers' professional development is not a part of the program design. The Science Camp Program is an integrated interdisciplinary program which promotes academic achievement in all areas as well as educational and career options. In addition to the student learning, teachers can have an opportunity to gain professional development experience from their participation in the program.

The fact that the Science Camp is in its eleventh year of operation while the Discovery Engineering Program is a one year pilot, is also evident in the data. The consistency of the staff and the duration of the Science Camp has allowed it to develop into a program which reflects the needs of the students and teachers. It can be assumed that the same will happen with the Discovery Engineering Program over time.

Parent Surveys. The majority of parents, 75%, who enrolled students in the Science Camp did so because they wanted their children to have an opportunity to work with and learn from other teachers and students. The reasons varied for parents enrolling students in the Discovery Science Program. The primary reasons included the students' interest in engineering, the opportunity to do something academically oriented over the summer, and the possible future benefits for the student. According to most of the parents of students in the Science Camp, the most important things learned during the summer were problem solving, using graphing calculators, writing pervasively, and learning how to set career objectives. Important items learned by students in the Discovery Engineering Program included the study of electricity and robots and learning how to write a resume.

Parents were asked to rate the attitudes and efforts of the summertime teaching staff on a scale in which the high ratings were labeled always and mostly, the average rating was sometimes, and the low ratings were not often and never. Parents also had the option of choosing "don't know." Among the Science Camp parents responding to the survey, everyone selected high ratings for the teaching staff. The majority of Discovery Engineering parents, 64 - 96%, who responded to the survey also rated the teaching staff high. Some exceptions were evident, though, as 4-8% of these parents rated the staff as average in the providing extra help, helping students to be problem-solvers, and helping students show their learning. Ratings of average to low were given by 12 - 20% of the Discovery Engineering parents in regard to the teaching staffs' focus on improving math and science. In addition a range of 4 - 12% of these parents were unable to rate the teaching staffs' effectiveness because they "didn't know." (Figure 4)

Figure 4

Survey Items: Effectiveness of the Teaching Staff	Percentage of Response					
	Science Camp			Discovery Engineering		
	High	Average to Low	Don't Know	High	Average to Low	Don't Know
Expect everyone to do his or her best	100%			96%		4%
Expect everyone to behave	100%			86%		12%
Help everyone to be a problem solver	100%			84%	4%	12%
Tell everyone to do his/her best	100%			92%		8%
Give everyone extra help if needed	100%			84%	8%	8%
Help everyone show their learning	100%			84%	4%	12%
Try to improve everyone's math	100%			64%	20%	8%
Try to improve everyone's science	100%			80%	12%	8%
Try to improve everyone's skill with computers	100%			88%		8%

Similar results were evident when parents were asked to rate the appropriateness of homework and the effectiveness of the tutors. The majority of Science Camp parents, 75%, felt the homework was appropriate. In addition, they all rated the helpfulness of the tutors as very high. Similarly, 80% of the Discovery Engineering parents rated the helpfulness of the tutors as very high. Only 70% of the parents rated the homework as appropriate, with the remainder indicating that either they "didn't know" or it was not appropriate. Averaging the grades provided by parents, asked for on the survey, resulted in a grade of A from the Science Camp parents and a B from the Discovery Engineering parents.

Summary. Although results from the parents involved in each program differ, overall, the ratings are high in most areas. The differences may be explained by a combination of factors, including the introduction of the Discovery Engineering Program and the age difference between students participating in each program. Discovery Engineering is in its first year of operation and is designed for older students. Unlike the younger Science Camp students, it is likely that the high school students spend less time sharing with parents. In addition, many of these students attend schools throughout Greater Hartford unlike the students in the Science Camp, who attend school and will continue to attend school in Hartford. These factors are most likely attributed to the differing perceptions of the parent groups.

Student Surveys. A large majority of the Science Camp students, 80%, indicated that they enjoyed the program, with 70% responding that they always had fun. The percentage of

students with similar responses to the Discovery Engineering Program was even higher, with 99% of these responding students indicating a high level of enjoyment and 76% saying they had fun every day. Students from both programs identified the field trips as their favorite part of the program. Students from the Science Camp also included stipends, group activities, and science labs among their favorite things. The responses given by the Discovery Engineering students were more varied, with the majority including among their favorite things working with computers, participating in the guidance classes, and meeting new teachers and students. The most important things learned at the Science Camp were the use of the graphing calculators, dissection techniques and procedures, test-taking and note-taking skills, and self awareness information. According to the Discovery Engineering students, they learned how to use the Internet and Power Point; important facts and information about electricity and robotics; how to write resumes and conduct interviews; different career options; and how to improve their self-esteem.

Similar to the *Parent Survey*, students were asked to rate the attitudes and efforts of the summertime teaching staff using high ratings of always and mostly, average ratings of sometimes, and low ratings of not often or never. Comparison of the data results showed that the rates given by the Science Camp parents and the students were similar in most areas. Like the parents, all of the students selected high ratings for the teaching staff in six of the nine areas. The exceptions included an average rating by 20% of the students on the staffs' focus on problem solving, and a low rating by 10% of the students on the staffs' expectation that the students would and could do their best. The students attending the Discovery Engineering program provided more varied responses. But, unlike the Science Camp students, they all agreed at a high level that the staff had encouraged and expected them to do their best. Overall the Discovery engineering students provided responses that were higher than their parents, with the only evident concern in the area of problem solving. (Figure 5)

Figure 5

Survey Items: Effectiveness of the Teaching Staff	Percentage of Response					
	Science Camp			Discovery Engineering		
	High	Ave.	Low	High	Ave.	Low
Expect everyone to do his or her best	90%		10%	97%		
Expect everyone to behave	100%			97%		
Help everyone to be a problem solver	80%	20%		76%	21%	
Tell everyone to do his/her best	90%		10%	97%		
Give everyone extra help if needed	100%			86%	3%	7%
Help everyone show their learning	100%			83%	7%	3%
Try to improve everyone's math	100%			90%	3%	3%
Try to improve everyone's science	100%			93%	3%	
Try to improve everyone's skill with computers	100%			86%	7%	3%

The majority of students in both programs, 70%, indicated that the homework was appropriate. Most of the responding students enrolled in the Discovery Engineering Program, 90%, selected high ratings for the assistance provided by the tutors, as compared to only 60% of the Science Camp students. Similarly, a large percentage of the Discovery Engineering students, 87%, rated the information they received about necessary academic preparation for college as high, while only 60% of the Science Camp students provided a similar rating to the information they received regarding their preparation for high school. All Students, in response to an item asking them to provide a grade for the program, selected either an A or B. The average was higher for Discovery Engineering students, of whom 70% selected A as compared to only 40% of the Science Camp students.

Summary. Survey data suggests that both programs were very well received by the students. Overall, a greater percentage of the responding Discovery Engineering students rated the program and all its components higher than the Science Camp students. In addition, the ratings provided by the Discovery Engineering students were even higher than those provided by many parents and teachers in the program. Reasons for these differences may be attributable in some part to the age of the students involved in the program. The high school students involved in the Discovery Engineering Program are likely to be more focused on academic achievement and on their future needs than the younger students. Even though, all students enrolled maintained a high level of attendance and appreciation for the programs and opportunities offered to them through the CPEP's Summer Enrichment Program.

CONCLUSIONS

The Summer Enrichment Program provides middle and high school students from the Greater Hartford area with opportunities to gain confidence in their abilities and to expand their knowledge of science, mathematics, and engineering. In addition, the program encourages and guides them through the processes needed to set career objectives and prepare for higher levels of education from high school to college. The integrated "hands-on" approach is fun, challenging, and relevant enough to the students needs and interest to maintain a 98% attendance rate during the five-week summer program.

Data collected from teachers, parents, and students show high levels of satisfaction with most components of the program. Some differences were evident, though, between the two programs. One cause of these differences seems to be attributable to the first year status of the Discovery Engineering Program as compared to the eleven-year history of the Science Camp Program. Based on the solid ratings received from teachers, parents, and students on the Science Camp Program, it can be assumed that with further development, the Discovery Engineering Program will receive ratings equally as high from all participants. For example, using data and experiences gained from the first year of the program, teachers and program staff can work more closely to match the program with the students' needs and to the instructional objectives and resources available.

Differences in responses provided by parents and students to the two programs, again, may be less the result of the program designs, than a result of the age of the students selected for the program. The responses collected from parents and students in the Science Camp Program show more awareness of the program by parents, which would be expected with this age group. As students move into the high school years, the information shared between parent and child and school and parent is often less as evidenced by the percentage of parents who responded with "don't know." A second impact caused by age differences may be in the students understanding of the need to prepare for the future. On average, more of the Discovery Engineering students rated the impact of the program as very high as compared to slightly less of the Science Camp students. The fact that these students are getting closer to the end of their high school careers and beginning to make plans for college may explain the differences in these responses.

Regardless of the different responses provided by teachers, parents, and students to the Summer Enrichment Programs, every participant learned, was challenged, had fun, and gained immediate and future benefits from these programs. Very few expressed any concerns with the program design, expectations, staff, or outcomes. The Science Camp Program and the Discovery Engineering Program clearly met the objectives outlined for the project and provided a substantial academic experience to a large number of urban students.

RECOMMENDATIONS

Few recommendations for improvement were given by any of the survey respondents, as most were satisfied with the programs as designed. Similarly, the evident success of the program to meets its objectives and provide a quality program for the students resulted in only a few recommendations for improving and maintaining the program:

- Continue to offer both programs to middle and high school students in the Greater Hartford area.
- Use the experiences from this year and from the successful years of the Science Camp Program to further develop the Discovery Engineering Program helping it to better meet the needs of the students and teachers.
- Provide more opportunities for parents of the high school students to become aware of the programs' expectations and daily procedures.
- Begin the hiring process for teachers and the selection processes for students earlier in the year.

E. Biographical Sketches

Curriculum Research and Evaluation is a firm that is devoted to research and development of programs in the field of education. CRE's specialities are: (1) to provide services in order to evaluate the quality of education programs for private business and industrial companies, public and private funding agencies, and schools; and (2) to develop and guide the implementation of curriculum and instruction.

Charles Bruckerhoff is Principal Evaluator and Research Associate for Curriculum Research and Evaluation. He received his doctorate from the University of Wisconsin. His research interests are curriculum theory and development, philosophy of education, effects of public policy on the classroom teacher, and school restructuring. He is the author of *Between Classes: Faculty Life at Truman High* and has written articles on curriculum development, qualitative research, urban collaboratives, and disadvantaged youth.

Theresa Bruckerhoff is Operations Manager and Research Associate for Curriculum Research and Evaluation. She has a B.S. in Elementary Education and a M.S. in Curriculum and Instruction. She has sixteen years of teaching experience ranging from preschool to the middle school levels. She taught in gifted programs, special education programs, and is an experienced classroom teacher. Most recently she has held executive board positions for child care centers and a nursery school. Currently, she studies state and national programs for teachers' professional development and school restructuring.

APPENDIX

TISC Tables

TISC Tables

Table A 1997-98
Demographics for CPMSA (All) Schools

LEVEL	GR	Male	Fema	Total	Ind	As	Black	Hisp.	Cauc	Minor	Total
Grade K-5	KG	1,105	1,167	2,272	2	27	989	1,164	90	2,155	2,272
	01	1,401	1,238	2,639	2	13	1,154	1,377	93	2,533	2,639
	02	1,149	1,203	2,352	2	14	1,043	1,203	90	2,248	2,352
	03	1,155	1,116	2,271	1	20	995	1,161	94	2,157	2,271
	04	1,120	996	2,116	2	10	905	1,094	105	2,001	2,116
	05	1,016	981	1,997	3	15	837	1,059	83	1,899	1,997
Sum		6,946	6,701	13647	12	99	5,923	7,058	555	12993	13647
Grade 6-8	06	980	921	1,901	2	20	792	1,005	82	1,799	1,901
	07	1,061	1,029	2,090	0	16	924	1,062	88	1,986	2,090
	08	899	927	1,826	0	17	804	921	84	1,725	1,826
Sum		2,940	2,877	5,817	2	53	2,520	2,988	254	5,510	5,817
Grade 9-12	09	1,256	1,255	2,511	0	19	1,153	1,243	96	2,396	2,511
	10	662	653	1,315	1	13	664	579	58	1,244	1,315
	11	450	472	922	1	14	482	375	50	858	922
	12	348	470	818	1	8	464	307	38	772	818
Sum		2,716	2,850	5,566	3	54	2,763	2,504	242	5,270	5,566
TOTAL		12602	12428	25030	17	206	11206	12550	1051	23773	25030

Table B4 1997-98
NSF Selected Math Course Enrollment & Completion for Three High Schools

Course	SUCCESS	Male	Fema	Total	Ind	As	Black	Hisp.	Cauc	Minor	Total
9th Gr. Alg.	Enroll	179	255	434	0	6	246	156	26	402	434
	Comple	61	97	158	0	6	69	66	17	135	158
Geometry	Enroll	180	295	475	0	7	316	121	31	437	475
	Comple	90	131	221	0	5	144	55	17	199	221
Alg. 2	Enroll	159	195	354	1	12	213	95	33	309	354
	Comple	58	94	152	1	6	78	46	21	125	152
PreCalculus	Enroll	50	75	125	0	1	82	27	15	109	125
	Comple	22	40	62	0	0	36	17	9	53	62
Calculus	Enroll	7	28	35	0	3	22	4	6	26	35
	Comple	6	18	24	0	3	13	2	6	15	24

Note: Completion means Earning a grade C or better.

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Table B5 1997-98
NSF Selected Science Course Enrollment & Completion for Three High Schools

Course	SUCCESS	Male	Fema	Total	Ind	As	Black	Hisp.	Cauc	Minor	Total
Physics	Enrolled	32	48	80	0	4	59	12	5	71	80
	Complete	14	30	44	0	2	29	8	5	37	44
Biology	Enrolled	288	463	751	1	12	485	201	52	687	751
	Complete	153	280	433	1	10	284	101	37	386	433
Chemistry	Enrolled	123	194	317	0	10	188	88	31	276	317
	Complete	80	120	200	0	6	108	59	27	167	200
AP Science	Enrolled	12	13	25	0	4	5	7	9	12	25
	Complete	9	10	19	0	2	4	4	9	8	19
Oth Ac Sci	Enrolled	62	80	142	0	2	41	87	12	128	142
	Complete	26	41	67	0	2	17	42	6	59	67

Note: Completion means Earning a grade C or better.

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Table C1 1997-98
12th Grade Graduation Data Summary for CPMSA (All) Schools

SCORE	Male	Fema	Total	Ind	As	Black	Hisp.	Cauc	Minor	Total
Diploma	205	331	594	1	7	357	203	26	561	594
Other	112	119	231	0	1	126	93	11	219	231
TOTAL	317	450	825	1	8	483	296	37	780	825

Table C1 1997-98
12th Grade Graduation Data Summary for CPMSA (All) Schools

Proficient	Male	Fema	Total	Ind	As	Black	Hisp.	Cauc	Minor	Total
No	303	427	787	1	7	455	292	32	748	787
Yes	14	23	38	0	1	28	4	5	32	38
TOTAL	317	450	825	1	8	483	296	37	780	825

Table D 1997-98
Sept. 1997 CMT Results for CPMSA (All) Schools

rade	SCORE	Male	Fema	Total	Ind	As	Black	Hisp.	Cauc	Minor	Total
04	Above Goal	162	173	335	1	6	135	143	50	279	335
	Below Goal	274	287	561	6	4	267	261	23	534	561
	Well Below	298	277	575	4	3	237	321	10	562	575
	No Score	222	177	399	1	1	118	268	11	387	399
Sum		956	914	1,870	12	14	757	993	94	1,762	1,870
06	Above Goal	99	117	216	1	11	78	93	33	172	216
	Below Goal	270	329	599	11	1	267	302	18	580	599
	Well Below	236	254	490	11	1	204	269	5	484	490
	No Score	245	135	380	0	4	119	249	8	368	380
Sum		850	835	1,685	23	17	668	913	64	1,604	1,685
08	Above Goal	87	100	187	0	14	78	66	29	144	187
	Below Goal	246	287	533	1	2	225	278	27	504	533
	Well Below	240	277	517	4	2	246	262	3	512	517
	No Score	202	163	365	2	2	117	228	16	347	365
Sum		775	827	1,602	7	20	666	834	75	1,507	1,602
TOTAL		2,581	2576	5,157	42	51	2,091	2,740	233	4,873	5,157

Table E 1998
Spr. 1997 CAPT Math Results for All (CPMSA) High Schools

Score	Male	Fema	Total	Ind	As	Black	Hisp.	Cauc	Minor	Total
Above Goal	15	22	37	0	0	17	9	11	26	37
Below Goal	73	69	142	0	4	85	44	9	129	142
Well Below	175	221	396	0	3	217	171	5	388	396
No Score	158	125	284	1	5	138	133	7	272	284
TOTAL	421	437	859	1	12	457	357	32	815	859

Table E 1997-98
Spr. 1997 CAPT Science Results for All High Schools

Score	Male	Fema	Total	Ind	As	Black	Hisp.	Cauc	Minor	Total
Above Goal	19	17	36	0	1	14	10	11	24	36
Below Goal	76	88	164	0	1	99	55	9	154	164
Well Below	180	214	394	0	4	204	183	3	387	394
No Score	146	118	265	1	6	140	109	9	250	265
TOTAL	421	437	859	1	12	457	357	32	815	859

Table F1
AP Test (Mathematics) 1997-98 for All Schools

PSCORE	Male	Fema	Total	Ind	As	Black	Hisp.	Cauc	Minor	Total
1	4	13	17	0	3	7	3	4	10	17
2	0	1	1	0	0	0	1	0	1	1
3	1	1	2	0	0	0	0	2	0	2
TOTAL	5	15	20	0	3	7	4	6	11	20

Table F2 AP Biology
AP Test (Science) for CMPSMA (All) Schools

TTLE	APSCORE	Male	Fema	Total	Ind	As	Black	Hisp.	Cauc	Minor	Total
AP Biology	1	3	3	6	0	1	2	3	0	5	6
	2	0	3	3	0	2	1	0	0	1	3
	3	2	2	4	0	0	1	1	2	2	4
	4	1	0	1	0	0	0	0	1	0	1
	5	0	1	1	0	0	1	0	0	1	1
	TOTAL	6	9	15	0	3	5	4	3	9	15
Sum		6	9	15	0	3	5	4	3	9	15

Table F2 AP Chemistry
AP Test (Science) for CMPSMA (All) Schools

TTLE	APSCORE	Male	Fema	Total	Ind	As	Black	Hisp.	Cauc	Minor	Total
AP Chemistry	1	2	2	4	0	1	0	1	2	1	4
	2	0	1	1	0	0	0	1	0	1	1
	3	2	1	3	0	0	0	1	2	1	3
	4	1	0	1	0	0	0	0	1	0	1
	5	1	0	1	0	0	0	0	1	0	1
	TOTAL	6	4	10	0	1	0	3	6	3	10
Sum		6	4	10	0	1	0	3	6	3	10

Supporting Tables

Table B4 1997-98
High School Math Enrollment & Completion by High Schools

Bulkeley

Course	SUCCESS	Male	Fema	Total	Ind	As	Black	Hisp.	Cauc	Minor	Total
9th Gr. Alg.	0	17	27	44	0	0	10	30	4	40	44
	1	31	41	72	0	4	11	42	15	53	72
Sum		48	68	116	0	4	21	72	19	93	116
Geometry	0	24	26	50	0	0	14	27	9	41	50
	1	24	26	50	0	2	5	27	16	32	50
Sum		48	52	100	0	2	19	54	25	73	100
Alg. 2	0	19	15	34	0	1	8	20	5	28	34
	1	24	25	49	0	4	7	27	11	34	49
Sum		43	40	83	0	5	15	47	16	62	83
PreCalculus	0	5	2	7	0	0	1	1	5	2	7
	1	4	2	6	0	0	0	2	4	2	6
Sum		9	4	13	0	0	1	3	9	4	13
Calculus	1	3	5	8	0	2	0	1	5	1	8
Sum		3	5	8	0	2	0	1	5	1	8
Sum		151	169	320	0	13	56	177	74	233	320

Note: Completion means Earning a grade C or better.

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Table B4 1997-98
High School Math Enrollment & Completion by High Schools

Hartford

Course	SUCCESS	Male	Fema	Total	Ind	As	Black	Hisp.	Cauc	Minor	Total
9th Gr. Alg.	0	37	45	82	0	0	28	49	5	77	82
	1	14	20	34	0	2	11	19	2	30	34
Sum		51	65	116	0	2	39	68	7	107	116
Geometry	0	23	74	97	0	2	54	36	5	90	97
	1	25	25	50	0	3	21	25	1	46	50
Sum		48	99	147	0	5	75	61	6	136	147
Alg. 2	0	40	38	78	0	5	40	27	6	67	78
	1	19	36	55	1	2	25	18	9	44	55
Sum		59	74	133	1	7	65	45	15	111	133
PreCalculus	0	7	12	19	0	1	8	9	1	17	19
	1	13	18	31	0	0	11	15	5	26	31
Sum		20	30	50	0	1	19	24	6	43	50
Calculus	0	0	6	6	0	0	4	2	0	6	6
	1	3	2	5	0	1	2	1	1	3	5
Sum		3	8	11	0	1	6	3	1	9	11
Sum		181	276	457	1	16	204	201	35	406	457

Note: Completion means Earning a grade C or better.

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Table B4 1997-98
High School Math Enrollment & Completion by High Schools

Weaver

Course	SUCCESS	Male	Fema	Total	Ind	As	Black	Hisp.	Cauc	Minor	Total
9th Gr. Alg.	0	64	86	150	0	0	139	11	0	150	150
	1	16	36	52	0	0	47	5	0	52	52
Sum		80	122	202	0	0	186	16	0	202	202
Geometry	0	43	64	107	0	0	104	3	0	107	107
	1	41	80	121	0	0	118	3	0	121	121
Sum		84	144	228	0	0	222	6	0	228	228
Alg. 2	0	42	48	90	0	0	87	2	1	89	90
	1	15	33	48	0	0	46	1	1	47	48
Sum		57	81	138	0	0	133	3	2	136	138
PreCalculus	0	16	21	37	0	0	37	0	0	37	37
	1	5	20	25	0	0	25	0	0	25	25
Sum		21	41	62	0	0	62	0	0	62	62
Calculus	0	1	4	5	0	0	5	0	0	5	5
	1	0	11	11	0	0	11	0	0	11	11
Sum		1	15	16	0	0	16	0	0	16	16
Sum		243	403	646	0	0	619	25	2	644	646

Note: Completion means Earning a grade C or better.

Table B5 1997-98
High School Science Enrollment & Completion by High School

Bulkeley

Course	SUCCESS	Male	Fema	Total	Ind	As	Black	Hisp.	Cauc	Minor	Total
Physics	Complete	2	2	4	0	2	0	1	1	1	4
Sum		2	2	4	0	2	0	1	1	1	4
Biology	Incompl	31	39	70	0	2	13	46	9	59	70
	Complete	44	46	90	0	3	18	46	23	64	90
Sum		75	85	160	0	5	31	92	32	123	160
Chemistry	Incompl	8	10	18	0	0	6	11	1	17	18
	Complete	25	31	56	0	4	7	26	19	33	56
Sum		33	41	74	0	4	13	37	20	50	74
AP Science	Incompl	2	1	3	0	2	1	0	0	1	3
	Complete	8	7	15	0	2	1	3	9	4	15
Sum		10	8	18	0	4	2	3	9	5	18
Oth Ac Sci	Incompl	14	21	35	0	0	9	23	3	32	35
	Complete	14	25	39	0	2	6	26	5	32	39
Sum		28	46	74	0	2	15	49	8	64	74
Sum		148	182	330	0	17	61	182	70	243	330

Note: Completion means Earning a grade C or better.

Table B5 1997-98
High School Science Enrollment & Completion by High School

Hartford

Course	SUCCESS	Male	Fema	Total	Ind	As	Black	Hisp.	Cauc	Minor	Total
Physics	Incompl	11	7	18	0	2	12	4	0	16	18
	Complete	5	11	16	0	0	6	6	4	12	16
Sum		16	18	34	0	2	18	10	4	28	34
Biology	Incompl	30	61	91	0	0	43	42	6	85	91
	Complete	46	82	128	1	7	61	46	13	108	128
Sum		76	143	219	1	7	104	88	19	193	219
Chemistry	Incompl	17	32	49	0	4	26	16	3	42	49
	Complete	32	49	81	0	2	39	32	8	71	81
Sum		49	81	130	0	6	65	48	11	113	130
AP Science	Incompl	1	2	3	0	0	0	3	0	3	3
	Complete	1	3	4	0	0	3	1	0	4	4
Sum		2	5	7	0	0	3	4	0	7	7
Oth Ac Sci	Incompl	22	18	40	0	0	15	22	3	37	40
	Complete	12	16	28	0	0	11	16	1	27	28
Sum		34	34	68	0	0	26	38	4	64	68
Sum		177	281	458	1	15	216	188	38	405	458

Note: Completion means Earning a grade C or better.

NSF-B5-98.SPS 8-OCT-98

Table B5 1997-98
High School Science Enrollment & Completion by High School

Weaver

Course	SUCCESS	Male	Fema	Total	Ind	As	Black	Hisp.	Cauc	Minor	Total
Physics	Incompl	7	11	18	0	0	18	0	0	18	18
	Complete	7	17	24	0	0	23	1	0	24	24
Sum		14	28	42	0	0	41	1	0	42	42
Biology	Incompl	74	83	157	0	0	145	12	0	157	157
	Complete	63	152	215	0	0	205	9	1	214	215
Sum		137	235	372	0	0	350	21	1	371	372
Chemistry	Incompl	18	32	50	0	0	48	2	0	50	50
	Complete	23	40	63	0	0	62	1	0	63	63
Sum		41	72	113	0	0	110	3	0	113	113
Sum		192	335	527	0	0	501	25	1	526	527

Note: Completion means Earning a grade C or better.

NSF-B5-98.SPS 8-OCT-98

Table C1 1997-98
12th Grade Graduation Data Summary by High School

Bulkeley

Sch	Grad Stat	Male	Fema	Total	Ind	As	Black	Hisp.	Cauc	Minor	Total
61	Diploma	66	109	175	1	4	42	111	17	154	175
	Other	39	32	71	0	0	20	44	7	64	71
Sum		105	141	246	1	4	62	155	24	218	246

Sch	Proficient	Male	Fema	Total	Ind	As	Black	Hisp.	Cauc	Minor	Total
61	No	101	140	241	1	4	62	154	20	217	241
	Yes	4	1	5	0	0	0	1	4	1	5
Sum		105	141	246	1	4	62	155	24	218	246

Table C1 1997-98
12th Grade Graduation Data Summary by High School

Hartford

Sch	Grad Stat	Male	Fema	Total	Ind	As	Black	Hisp.	Cauc	Minor	Total
62	Diploma	73	94	167	0	3	70	85	9	155	167
	Other	38	50	88	0	1	35	48	4	83	88
Sum		111	144	255	0	4	105	133	13	238	255

Sch	Proficient	Male	Fema	Total	Ind	As	Black	Hisp.	Cauc	Minor	Total
62	No	104	142	246	0	3	101	130	12	231	246
	Yes	7	2	9	0	1	4	3	1	7	9
Sum		111	144	255	0	4	105	133	13	238	255

Table C1 1997-98
12th Grade Graduation Data Summary by High School

Weaver

Sch	Grad Stat	Male	Fema	Total	Ind	As	Black	Hisp.	Cauc	Minor	Total
63	Diploma	66	128	194	0	0	187	7	0	194	194
	Other	35	37	72	0	0	71	1	0	72	72
Sum		101	165	266	0	0	258	8	0	266	266

Table C1 1997-98
12th Grade Graduation Data Summary by High School

Weaver

Sch	Proficient	Male	Fema	Total	Ind	As	Black	Hisp.	Cauc	Minor	Total
63	No	98	145	243	0	0	235	8	0	243	243
	Yes	3	20	23	0	0	23	0	0	23	23
Sum		101	165	266	0	0	258	8	0	266	266

Table E 1998
Spr. 1997 CAPT Math Results by High School

School	Score	Male	Fema	Total	Ind	As	Black	Hisp.	Cauc	Minor	Total
BULKELEY	Above Goal	4	3	7	0	0	0	1	6	1	7
	Below Goal	24	14	38	0	0	10	21	7	31	38
	Well Below	51	66	117	0	3	23	87	4	110	117
	No Score	71	51	123	0	4	44	69	6	113	123
Sum		150	134	285	0	7	77	178	23	255	285
HPHS	Above Goal	7	15	22	0	0	9	8	5	17	22
	Below Goal	31	25	56	0	4	28	22	2	50	56
	Well Below	74	101	175	0	0	92	82	1	174	175
	No Score	58	49	107	0	1	45	61	0	106	107
Sum		170	190	360	0	5	174	173	8	347	360
WEAVER	Above Goal	4	4	8	0	0	8	0	0	8	8
	Below Goal	18	30	48	0	0	47	1	0	48	48
	Well Below	50	54	104	0	0	102	2	0	104	104
	No Score	29	25	54	1	0	49	3	1	53	54
Sum		101	113	214	1	0	206	6	1	213	214

Table E 1997-98
Spr. 1997 CAPT Science Results by High School

School	Score	Male	Fema	Total	Ind	As	Black	Hisp.	Cauc	Minor	Total
BULKELEY	Above Goal	6	5	11	0	0	2	2	7	4	11
	Below Goal	23	15	38	0	0	8	23	7	31	38
	Well Below	61	71	132	0	3	26	100	3	126	132
	No Score	60	43	104	0	4	41	53	6	94	104
Sum		150	134	285	0	7	77	178	23	255	285
HPHS	Above Goal	11	11	22	0	1	9	8	4	17	22
	Below Goal	34	44	78	0	1	44	31	2	75	78
	Well Below	71	90	161	0	1	80	80	0	160	161
	No Score	54	45	99	0	2	41	54	2	95	99
Sum		170	190	360	0	5	174	173	8	347	360
WEAVER	Above Goal	2	1	3	0	0	3	0	0	3	3
	Below Goal	19	29	48	0	0	47	1	0	48	48
	Well Below	48	53	101	0	0	98	3	0	101	101
	No Score	32	30	62	1	0	58	2	1	61	62
Sum		101	113	214	1	0	206	6	1	213	214

SF-CAPT-98.SPS

Table F1
AP Test (Mathematics) 1997-98 by High School

School	APSCORE	Male	Fema	Total	Ind	As	Black	Hisp.	Cauc	Minor	Total
Bulkeley	1	2	3	5	0	2	0	0	3	0	5
	2	0	1	1	0	0	0	1	0	1	1
	3	1	1	2	0	0	0	0	2	0	2
Sum		3	5	8	0	2	0	1	5	1	8
Hartford	1	2	9	11	0	1	6	3	1	9	11
Sum		2	9	11	0	1	6	3	1	9	11
Weaver	1	0	1	1	0	0	1	0	0	1	1
Sum		0	1	1	0	0	1	0	0	1	1

Table F2 1998
AP Test (Science) by High School

Bulkeley

SCH	APSCORE	Male	Fema	Total	Ind	As	Black	Hisp.	Cauc	Minor	Total
B	1	4	2	6	0	2	1	1	2	2	6
	2	0	4	4	0	2	1	1	0	2	4
	3	3	2	5	0	0	0	1	4	1	5
	4	2	0	2	0	0	0	0	2	0	2
	5	1	0	1	0	0	0	0	1	0	1
Sum		10	8	18	0	4	2	3	9	5	18

Table F2 1998
AP Test (Science) by High School

Hartford

SCH	APSCORE	Male	Fema	Total	Ind	As	Black	Hisp.	Cauc	Minor	Total
H	1	1	3	4	0	0	1	3	0	4	4
	3	1	1	2	0	0	1	1	0	2	2
	5	0	1	1	0	0	1	0	0	1	1
Sum		2	5	7	0	0	3	4	0	7	7

Hartford Public Schools
Assessment, Evaluation & Research

Attendance/Enrollment Report (PreK through 12)
Thursday, October 1, 1998

DATA ENTERED →

	Information Technologies (10/13)			Data from Schools		
SCHOOL	Enrollment	Attendance		Enrollment	Attendance	
		Number	% of Enrl.		Number	% of Enrl.
Barbour	211	211	100.0%	211	206	97.6%
Barnard Brown	454	454	100.0%	448	430	96.0%
Batchelder	570	556	97.5%	571	555	97.2%
Betances	434	421	97.0%	434	422	97.2%
Burns	664	646	97.3%	664	647	97.4%
Burr	662	662	100.0%	655	618	94.4%
Clark	597	572	95.8%	597	573	96.0%
Dwight	588	579	98.5%	587	577	98.3%
Fisher	728	714	98.1%	729	716	98.2%
M.D. Fox Elem.	1,032	1,011	98.0%	1,026	986	96.1%
Mary Hooker	279	279	100.0%	277	262	94.6%
Kennelly	911	910	99.9%	909	885	97.4%
M.L. King	663	651	98.2%	662	651	98.3%
Kinsella	548	548	100.0%	543	517	95.2%
Moylan	768	768	100.0%	767	753	98.2%
Milner	559	559	100.0%	546	527	96.5%
Naylor	547	524	95.8%	546	523	95.8%
Parkville	779	779	100.0%	776	755	97.3%
Rawson	389	380	97.7%	392	382	97.4%
Sanchez	509	500	98.2%	504	495	98.2%
SAND	374	357	95.5%	371	356	96.0%
Simpson-Waverly	425	425	100.0%	424	407	96.0%
Mark Twain	444	444	100.0%	445	428	96.2%
Webster	521	499	95.8%	520	499	96.0%
West Middle	952	952	100.0%	931	880	94.5%
Wish	428	414	96.7%	428	412	96.3%
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Fox Middle	898	858	95.5%	898	805	89.6%
Quirk Middle	1,216	1,125	92.5%	1,205	1,100	91.3%
South Middle	700	664	94.9%	699	664	95.0%
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Bulkeley High	1,396	1,222	87.5%	1,385	1,205	87.0%
Hartford High	1,579	1,340	84.9%	1,558	1,340	86.0%
Weaver High	1,255	1,060	84.5%	1,252	1,065	85.1%
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
New Century	60	60	100.0%	60	41	68.3%
Montessori	116	116	100.0%	115	78	67.8%
H.T.L.A.	275	275	100.0%	246	186	75.6%
TOT.SP.PROG	451	451	100.0%	421	305	72.4%
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Choice Program	400	400	100.0%	529	529	100.0%
Out-of-District	not on computer			404	404	100.0%
Sports Science Academy	108	108	100.0%	204	193	94.6%
Project Breakthrough	not on computer			132	132	100.0%
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

100% attendance means no absentees recorded on the Vax mainframe files.
Higher numbers from Information Technologies probably indicate files not cleaned entirely of no-shows.
Lower numbers from Information Technologies probably indicate new registrations not all entered.

BEST COPY AVAILABLE

Math Course Enrollments, Fall 1998
By NSF Categories

BULKELEY

Category	Code	Title	Sect	Teacher	N Stud
Alg 1	7MAA	INT.MATH/A.&	3	000 PEREZ, M	4
	ZMBA	GLOBAL MATH	3	000 PEREZ, M	7
	1M1A	INT.MATH/ALG	7	000 PEREZ, M	20
	MI1A	INT.MATH/ALG	1	D CHOMICK	18
	MAAA	ALGEBRA 1 A	8	R DIGREGORIO	6
Sum					55
Geom	MGBA	GEOMETRY A	3	0 STEWART, C	19
	MI3A	INT/MATH ALG	3	D CHOMICK	12
	MGBH	GEOMETRY H	10	MR. WAGAR	21
Sum					52
Alg 2	MACH	ALGEBRA 2 H	1	0 BLAKE, WAL	18
	MI5A	INTEG MATH/G	8	0 STEWART, C	24
	MACA	ALGEBRA 2 A	1	D DANIELS	25
Sum					67
Pr Calc	MSDH	PRE CALCULUS	2	C MAGNO	18
	MSDA	PRE CALCULUS	2	MR. WAGAR	12
Sum					30
Calc	MICC	AP CALCULUS	1	C MAGNO	5
Sum					5
Other	MXXG	MATH CONNECT	3	. DEBOW, PAO	25
	1M1G	INT MATH/ALG	7	. ROJAS, E.	23
	1MGB	GEOMETRY BL	6	. ROJAS, E.	7
	1MP1	PREP/ALG.& G	1	. ROJAS, E.	23
	MAAG	ALGEBRA 1 G	4	0 BLAKE, WAL	25
	LV1M	VOC MATH I	3	0 MARTIN, JA	4
	LV3M	VOC MATH II	3	0 MARTIN, JA	1
	LV5M	VOC MATH 3	3	0 MARTIN, JA	3
	LV7M	VOC MATH 4	3	0 MARTIN, JA	2
	MM1P	INT ALG/GEO	1	0 STEWART, C	9
	ZM1B	MATH ENRICH	1	0 STEWART, C	9
	ZM1G	MATH ENRICH	1	0 STEWART, C	8
	7MAG	INT MATH ALG	3	000 PEREZ, M	10
	7MP1	PREP/ALG.&GE	2	000 PEREZ, M	22
	MI3G	INT.MATH ALG	4	D CHOMICK	15
	MIPG	PREP ALG/GEO	4	D CHOMICK	6
	MACG	ALG 2G	4	D DANIELS	27
	MGBG	GEOMETRY G	1	D DANIELS	25
	MXDH	COMPUTER TCH	2	L E PELS	5
	LM1S	I.E. MATH I	1	M. KENNEY	12
	LM3S	I.E. MATH II	1	M. KENNEY	5
	LM5S	I.E. MATH II	2	M. KENNEY	8
	LM7S	I.E. MATH IV	2	M. KENNEY	4

Math Course Enrollments, Fall 1998
By NSF Categories

BULKELEY

Category	Code	Title	Sect	Teacher	N Stud
Other	ZE1G	ENG ENRICH 1	8	M. MULLEN-BA	10
	OM1S	IE MATH I	5	S BRODEUR	7
	OM5S	IE MATH III	5	S BRODEUR	7
	OM7S	IE MATH IV	5	S BRODEUR	1
	MI1G	INT.MATH ALG	32	W.R. CASEY	12
Sum					315

Science Course Enrollments, Fall 1998
By NSF Categories

BULKELEY

Category	Code	Title	Sect	Teacher	N Stud
Biology	7SBA	BIOLOGY LAB	4	. MALDONADO,	1
	7SBH	BIOLOGY LAB	4	. MALDONADO,	3
	SBBH	BIOLOGY H/LA	2	A R BRICK	3
	SPCA	PHYSIOLOGY A	3	R SAMPL	12
	SPCH	PHYSIOLOGY H	7	R SAMPL	21
	SBBA	BIOLOGY A/LA	3	S M DEMAN	21
Sum					61
Chemstry	SCCH	CHEMISTRY H/	2	J DEGRANDI	7
	SCCA	CHEMISTRY A/	1	R O COLANGEL	17
Sum					24
Physics	SFCH	PHYSICS H/LA	8	. LEPARD,	10
Sum					10
AP Sci	SBCC	BIOLOGY AP/L	8	A P PHILLIPS	7
Sum					7
Other	SFCA	PHYSICS A/LA	8	. LEPARD,	3
	ZSKA	GLOB PHY SCI	10	. LUCIANO, I	7
	1S1G	SCIENCE GENE	1	. LUCIANO, I	18
	7LSG	CON/AR/SCI/E	3	. LUCIANO, I	19
	1SBG	BIOLOGY GENE	6	. LUCIANO, I	24
	7SBG	BIO G SH BL	10	. MALDONADO,	9
	7S1G	GEN.SCI.G SH	1	. MALDONADO,	20
	LS1V	VOC SCI I	4	0 MARTIN, JA	3
	LS3V	VOC SCI II	4	0 MARTIN, JA	4
	SBBG	BIOLOGY G	15	A R BRICK	12
	LS3S	I.E. BIO. I	4	J BING	8
	LS1S	I.E. EARTH S	3	J BING	13
	SC1B	SCIENCE 1 BA	33	J DEGRANDI	12
	SKCG	PHYSICAL SCI	4	J F JOHNSON	20
	OS1S	OE SCI I	4	M F ELTERICH	4
	OS3S	OE SCI II	4	M F ELTERICH	9
	SCCG	CHEMISTRY G/	3	R O COLANGEL	20
	SPCG	PHYSIOLOGY G	2	R SAMPL	13
	SC1A	SCIENCE 1	1	S M DEMAN	18
	SC1G	SCIENCE 1 GE	2	S M DEMAN	18
Sum					254

Math Course Enrollments, Fall 1998
By NSF Categories

HARTFORD

Category	Code	Title	Sect	Teacher	N Stud
Alg 1	MI1A	INT MATH	19	CECELIA BOYS	12
	MAAA	ALGEBRA 1A	4	CHERYL FELDE	2
	YMAA	CL MATH I	5	DENISE RACKL	26
	CMAA	CL MATH I	13	DONALD WILSO	19
Sum					59
Geom	MI3A	INT. MATH	2	CHERYL FELDE	6
	MGBA	GEOMETRY A	1	DENISE RACKL	18
	YMBA	CL MATH II	8	DENISE RACKL	24
	MGBH	GEOMETRY H	2	JOAO CAXIDE	23
Sum					71
Alg 2	MACA	ALGEBRA 2A	10	BRENDAN BURK	16
	MACH	ALGEBRA 2H	2	DENISE RACKL	13
	YMCA	CL MATH III	3	DONALD WILSO	19
	MI5A	INT. MATH	22	TORREY RACKL	19
Sum					67
Pr Calc	MSDH	PRE CALCULUS	2	BRENDAN BURK	16
	MSDA	PRE CALCULUS	2	DAVID VANIA	23
	YMDA	CL MATH IV	2	EDWARD ROSEN	12
Sum					51
Calc	MDDC	CALCULUS AP	2	HOBY LITTLEF	16
Sum					16
Other	MI1G	INT. MATH	21	CECELIA BOYS	21
	MP1G	PREP ALG & G	10	CECELIA BOYS	16
	MAAG	ALGEBRA 1G	4	CHERYL FELDE	21
	MACG	ALGEBRA 2G	3	CHERYL FELDE	25
	MI3G	INT. MATH	8	CHERYL FELDE	12
	7M1G	INTEGRATED M	2	CLARA VELEZ	15
	7M3G	INTEGRATED M	3	CLARA VELEZ	9
	CMAG	CL MATH G	11	EDWARD ROSEN	11
	YMEA	CL DISCRETE	7	EDWARD ROSEN	9
	7HGG	SHELTERED GE	10	IRENE KILLIA	21
	9MBS	BL CC MATH 2	1	JAIME NIEVES	7
	8MAS	BL CC MATH 1	2	JAIME NIEVES	7
	8MBS	CC MATH 2S	2	JAIME NIEVES	2
	8MCS	BL CC MATH 3	2	JAIME NIEVES	1
	8MDS	BL CC MATH 4	2	JAIME NIEVES	2
	9MCS	BL CC MATH 3	4	JAIME NIEVES	3
	9MDS	BL CC MATH 4	4	JAIME NIEVES	2
	1MAG	INTERGRATED	1	JOSE FELIZ	16
	1MPG	ALG & GEO	5	JOSE FELIZ	23
	7MPG	ALG & GEO	8	JOSE FELIZ	16
	DDMS	VOCA MATH	1	KATHLEEN O'M	6

Math Course Enrollments, Fall 1998
By NSF Categories

HARTFORD

Category	Code	Title	Sect	Teacher	N Stud
Other	9MAS	BL CC MATH 1	1	MARGARET PAG	12
	LMCS	CC MATH 3SE	1	PAUL WARRING	10
	LMAS	CC MATH 1SE	2	PAUL WARRING	12
	LMDS	CC MATH 4SE	5	PAUL WARRING	10
	LMBS	CC MATH 2SE	8	PAUL ZOCCO	9
	MGBG	INF GEOMETRY	3	PHIL FERLAZZ	23
	MXXG	MATH CONNECT	1	PHIL FERLAZZ	18
	MI5G	INT. MATH	1	VACANCY MATH	10
Sum					349

Science Course Enrollments, Fall 1998
By NSF Categories

HARTFORD

Category	Code	Title	Sect	Teacher	N Stud
Biology	SBAH	BIO/LAB H	5	GERALDINE MA	25
	CSAA	CL BIO/LAB	14	JAMES CIAGLO	17
	YSAA	CL BIO/LAB A	8	JAMES CIAGLO	21
	1SBA	BIO/LAB A	3	NORMA COTTO-	6
	SBBA	BIO/LAB A	11	RAYMOND COCO	25
	SPCA	PHYSIOLOGY A	1	SUSAN HAINES	18
	SPCH	PHYSIOLOGY H	1	SUSAN HAINES	6
Sum					118
Chemstry	YSCA	CL CHEM/LAB	1	JUAN RODRIGU	24
	SCCH	CHEM/LAB H	5	MR. PETERSON	17
	SCCA	CHEM/LAB A	12	MS. FLAHERTY	20
Sum					61
Physics	YSDA	CL PHYS/LAB	1	MADIS LINASK	9
	SFCA	PHYSICS/LAB	3	MADIS LINASK	9
	SFCH	PHYSICS /LAB	5	MADIS LINASK	17
Sum					35
AP Sci	SBCC	SR BIO/LAB A	8	SUSAN HAINES	11
Sum					11
Other	SBAG	GEN BIOLOGY	1	ALAN BASNEY	20
	SBAB	INTRO BIOLOG	4	ALAN BASNEY	20
	SC1G	SCIENCE 1G	10	ANN DAWSON	20
	SC1B	SCIENCE 1B	17	ANN DAWSON	17
	HSBG	BIL. HEALTH	5	BLANCA REYES	18
	SYLV	SLC	2	J. DR. COLON	21
	SCIA	SCIENCE A	12	JOHN WILMING	19
	DDSS	VOC/SCI/SOC	8	KATHLEEN O'M	7
	8SBS	CC PHY SCI 2	6	MARGARET PAG	1
	8SAS	BL CC LIFE S	6	MARGARET PAG	10
	LSAS	LIFE SCI 1SE	1	MAUREEN EDMO	12
	LSBS	CC LIFE PHY	8	MAUREEN EDMO	9
	SCCG	CHEM/LAB G	8	MS. FLAHERTY	16
	SKCG	PHYS SCIENCE	8	MS. SHIPMAN	23
	C. S	CAPT SCIENCE	2	MS. SHIPMAN	18
	1SBG	BIO/LAB G	3	NORMA COTTO-	13
	1SGG	GENERAL SCIE	1	NORMA COTTO-	7
	9SBS	BL CC PHY SC	8	PAT SULLIVAN	7
	9SAS	BL CC LIFE S	3	PAT SULLIVAN	11
	SICA	APPLIED PHYS	22	PAUL LEWIS	20
	SICG	APPLIED PHYS	22	PAUL LEWIS	12
	SICB	APPLIED PHYS	31	PAUL LEWIS	16
	SC1A	SCIENCE 1A	11	RICHARD FAIR	21
	CSAG	CL SCIENCE G	11	SHIRLEY WILS	11
	SBCA	SEE THE L/B-	3	SUSAN HAINES	4
	SBCH	SEE THE L/B-	3	SUSAN HAINES	3

Science Course Enrollments, Fall 1998
By NSF Categories

HARTFORD

Category	Code	Title	Sect	Teacher	N Stud
Other	SPCG	PHYSIOLOGY G	5	SUSAN HAINES	20
	1SPG	PHYSIOLOGY G	3	ZORAIDA ORTI	7
	7SAG	SHELT SCI G	4	ZORAIDA ORTI	17
Sum					400

Math Course Enrollments, Fall 1998
By NSF Categories

WEAVER

Category	Code	Title	Sect	Teacher	N Stud
Alg 1	MAAA	ALGEBRA 1 A	8	MS FORTIN,N	15
	MAAH	ALGEBRA 1 H	4	MS GOLDSTEIN	16
	MI1A	INTG ALG/GEO	4	MS GOLDSTEIN	24
Sum					55
Geom	MI3A	INT ALG/GEOM	8	MR BARANS,D	25
	MI3H	INT ALG/GEOM	2	MR MICKIEWIC	22
	MG5A	GEOMETRY	10	MS GOLDSTEIN	19
	MG7H	GEOMETRY	2	MS WRIGHT	5
Sum					71
Alg 2	MA5A	ALGEBRA II A	14	MR O'CONNOR	10
	MA7H	ALGEBRA II H	2	MR WHITE, D	14
	MI5A	INT ALG/GEOM	1	MS GORDON, Z	27
Sum					51
Pr Calc	MSDA	PRE-CALCULUS	6	MR WHITE, D	18
	MSDH	PRE-CALCULUS	10	MR. WARE, K.	26
	MT5A	TRIG	6	MS BROWN-MCD	15
Sum					59
Calc	MICC	AP CALCULUS	2	MS BROWN-MCD	17
Sum					17
Other	MI1G	INT ALG/GEO	16	MR BARANS,D	13
	MP1G	PREP ALG/GEO	11	MR BARANS,D	21
	LMCS	L.D. MATH 3	1	MR FLECK, T	9
	LMDS	L.D. MATH 4	1	MR FLECK, T	7
	LMAS	L.D. MATH 1	2	MR FLECK, T	16
	MAAG	ALGEBRA 1 G	2	MR MARTINELL	22
	MG5G	GEOMETRY	1	MR MARTINELL	11
	MI3G	INT ALG/GEOM	10	MS BROWN-MCD	18
	8MBR	NAC MATH 2	3	MS BROWN-MCD	11
	8MCR	NEW AR MATH	4	MS BROWN-MCD	5
	8MAR	NAC MATH 1	4	MS BURCHELL,	14
	MXXG	MA/CONNECT	1	MS FORTIN,N	16
	MA5G	ALGEBRA II	6	MS GORDON, Z	25
	MCCA	COMPUTER TEC	2	MS GORDON, Z	4
	LMBS	L.D. MATH 2	8	MS MAHEU	5
	MI5G	INT ALG/GEOM	2	MS PICKERING	18
	ZMAB	MATH ENRICH	1	MS/MR REYNOL	18
Sum					233

Science Course Enrollments, Fall 1998
By NSF Categories

WEAVER

Category	Code	Title	Sect	Teacher	N Stud
Biology	SBBA	BIO	20	MR HARRIS, D	13
	SBAH	BIOLOGY & LA	6	MR HARRIS, D	22
	SPCA	PHYSIOLOGY	2	MRS BACOTE-C	10
	SPCH	PHYSIOLOGY H	2	MRS BACOTE-C	8
	STLA	STUDY LAB BI	30	MS BROWN-MCD	17
Sum					70
Chemstry	SCCA	CHEM & LAB A	23	DR. HAUGHT,	20
	SCCH	CHEM & LAB H	3	DR. HAUGHT,	9
Sum					29
Physics	SFCA	PHYSICS A	6	DR. HAUGHT,	4
	SFCH	PHYSICS & LA	6	DR. HAUGHT,	12
	SICH	APPLD PHYSIC	8	MR MARTOCCIA	7
Sum					23
Other	LSAS	L.D. SCIENCE	13	MR FLECK, T	8
	LSBS	L.D. SCIENCE	3	MR FLECK, T	13
	SS1G	GENERAL SCI	1	MR SAGEMAN	25
	SBBG	BIO GENERAL	10	MR. DEVONE,	26
	SKCG	PHY SCIENCE	2	MR. O'NEIL,	24
	SRCG	RIVER SEARCH	6	MR. O'NEIL,	24
	SC1A	SCI I ACAD S	2	MRS BACOTE-C	31
	SC1B	SCI1 SEM1 BA	2	MRS BACOTE-C	13
	SC1G	SCI I SEM 1	2	MRS BACOTE-C	14
	SPCG	PHYSIOLOGY G	1	MRS HURSTON-	4
	SCCG	GNL CHEM	18	MS INGA	15
Sum					197

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